BROUGHT TO YOU BY

portland sustainability institute

ECODISTRICTS INSTITUTE

THE BUILDING BLOCKS OF SUSTAINABLE CITIES

PORTLAND, OR
MAY 8-10, 2012

Welcome to Portland!

We are delighted to host you for an exciting three days of collaboration, relationship-building and inspiring ideas with a single purpose—to accelerate district-scale sustainability.

Collectively the EcoDistricts Institute brings together 51 leaders and innovators from 10 cities across North America and 27 industry experts to shape the future of green neighborhood development.

District-scale sustainability solutions, such as district energy, green streets, smart grid, and comprehensive demand management, are well known. However, the widespread deployment of these strategies has been slow to develop due to a lack of comprehensive policy or implementation frameworks at the municipal level.

EcoDistricts provide a way forward. They are an important scale to accelerate sustainability—small enough to innovate quickly and big enough to have a meaningful impact. Success, however, will require cities to create a proactive district framework that focuses on integrating building and infrastructure projects with community and individual action.

The role of the EcoDistricts Institute is to help cities accelerate this work. By bringing together people like you—the best city and district innovators in North America—the Institute is creating a network-within-a-network of EcoDistrict leaders. During your time in Portland you will meet the public officials, industry leaders and civic entrepreneurs who are leading the change in their cities.

GREEN CITIES HERE, AND EVERYWHERE—THAT'S OUR VISION. THAT'S YOUR VISION, TOO, AND WE'RE GLAD YOU ARE JOINING US TO LEAD A NEW ERA OF URBAN INNOVATION.

Each participant in the Institute brings unique knowledge and experiences that will enrich your work. We hope you will rely on one another as resources and openly share what works—and what doesn't—as we collectively navigate EcoDistrict development.

This resource guide is packed with useful information; a suite of tools, resources and case studies created by the Portland Sustainability Institute to support your time in Portland and to drive your local projects when you return home.

We look forward to the next three days and to the EcoDistrict achievements to follow in the coming years.

EXECUTIVE DIRECTOR,
PORTLAND SUSTAINABILITY INSTITUTE

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Agenda

day 1
WHY

TUESDAY, MAY 8

WALKING TOUR, HOTEL MODERA + WIEDEN+KENNEDY

1:00 – 3:00	Site Tour *optional* Hotel Modera FRONT LOBBY	**ROB BENNETT**, Executive Director, Portland Sustainability Institute **DENNIS WILDE**, Chief Sustainability Officer, Gerding Edlen Development
4:00 – 4:45	Welcome + Introductions Hotel Modera MEETING ROOM ONE	**ROB BENNETT**, Executive Director, Portland Sustainability Institute **SUSAN ANDERSON**, Director, Portland Bureau of Planning and Sustainability **MOLLY MAYO**, Partner, Meridian Institute
4:45 – 5:30	EcoDistricts: Building Blocks of Sustainable Cities	**ROB BENNETT**, Executive Director, Portland Sustainability Institute **NAOMI COLE**, Program Director, Portland Sustainability Institute
5:30 – 6:00	City Team Work Session: Getting Oriented	**MOLLY MAYO**, Partner, Meridian Institute **FACILITATORS**
6:00 – 6:30	Travel to Wieden + Kennedy	
6:30 – 9:00	Opening Reception Wieden + Kennedy	
6:45 – 7:00	Welcome to Portland	**ROB BENNETT**, Executive Director, Portland Sustainability Institute **MAYOR SAM ADAMS** *invited*, Mayor, City of Portland **NICK BARHAM**, Global Director, Wieden + Kennedy
7:15 – 8:00	We Build Green Cities: Making the Business Case	**NICK BARHAM**, Global Director, Wieden + Kennedy **JOE CORTRIGHT**, President & Economist, Impresa **JOE STAPLES**, Creative Director, Wieden + Kennedy **TYLER WHISNAND**, Creative Director, Wieden + Kennedy
8:00 - 8:30	Discussion	

Agenda

day 2
WHAT

WEDNESDAY, MAY 9

ECOTRUST BUILDING + THE CLEANERS (ACE HOTEL)

8:00 – 9:00	Networking Breakfast	**SPENCER BEEBE**, President, Ecotrust
9:00 – 11:00	EcoDistrict Best Practices: Buildings + Infrastructure	**TRENT BERRY**, Founding Partner, Compass Resource Management **BERT GREGORY**, Design Partner & CEO, Mithun **BLAIR McCARRY**, Principal, Perkins + Will **DENNIS WILDE** *moderator*, Chief Sustainability Officer, Gerding Edlen Dev.
11:00 – 11:15	Break	
11:15 – 11:45	City Team Work Session: Buildings + Infrastructure	**MOLLY MAYO**, Partner, Meridian Institute **FACILITATORS**
11:45 – 1:00	Lunch with Experts	Experts at each table will lead discussions around urban sustainability topics: A North American EcoDistricts Program, new mobility, multi-utilities, LEED ND, etc.
1:00 – 3:00	EcoDistrict Best Practices: Community Action + Programs	**ERIN BARNES**, Co-founder and Executive Director, ioby **TONY DEFALCO**, Consultant, Tony DeFalco & Associates **GREG SEARLE**, Executive Director, BioRegional North America **TIM SMITH** *moderator*, Principal, SERA Architects
3:00 – 3:30	City Team Work Session: Community Action + Programs	**MOLLY MAYO**, Partner, Meridian Institute **FACILITATORS**
3:30 – 4:30	Vancouver Olympic Village: Building a Sustainable Showcase	**SCOT HEIN**, Architect and Senior Urban Designer, City of Vancouver **TOM OSDOBA** *moderator*, Principal, TAO Strategies **DAVE RAMSLIE**, Senior Sustainability Programs Manager, City of Vancouver
4:30 – 6:30	Break	
6:30 – 9:00	Seated Dinner The Cleaners	Family-style dinner followed by city attendees presenting innovative ideas from their hometowns

Agenda

day 3
HOW

THURSDAY, MAY 10

ECOTRUST BUILDING

7:30 – 8:15	**Breakfast with Peers**	An opportunity for counterparts to share experience through on-the-ground neighborhood sustainability work
8:15 – 9:45	**EcoDistrict Best Practices: Assessment + Project Roadmaps**	**ELIOT ALLEN**, Principal, Criterion Planners **ROB BENNETT** *moderator*, Exec. Director, Portland Sustainability Institute **TOM PUTTMAN**, President, Puttman Infrastructure
9:45 – 10:15	**City Team Work Session: Assessment + Project Roadmaps**	**MOLLY MAYO**, Partner, Meridian Institute **FACILITATORS**
10:15 – 10:30	**Break**	
10:30 – 12:00	**EcoDistrict Best Practices Partnerships + Governance**	**ELLEN BASSETT**, Associate Professor, Portland State University **NAOMI COLE** *moderator*, Program Director, Portland Sustainability Institute **LEW BOWERS,** Central City Division Manager, PDC
12:00 – 12:30	**City Team Work Session: Partnerships + Governance**	**MOLLY MAYO,** Partner, Meridian Institute **FACILITATORS**
12:30 – 1:45	**City Teams Working Lunch: Putting the Pieces Together**	**MOLLY MAYO,** Partner, Meridian Institute **FACILITATORS**
1:45 – 2:30	**City Teams Report Out**	**MOLLY MAYO,** Partner, Meridian Institute
2:30 – 3:00	**Closing Remarks + Next Steps**	**ROB BENNETT**, Executive Director, Portland Sustainability Institute **MOLLY MAYO,** Partner, Meridian Institute
3:00	**Adjourn**	

EcoDistricts

THE BUILDING BLOCKS OF SUSTAINABLE CITIES

5 8

PHASES

1	2	3	4	5
DISTRICT ORGANIZATION	DISTRICT ASSESSMENT	PROJECT FEASIBILITY	PROJECT DEVELOPMENT	DISTRICT MONITORING

PERFORMANCE AREAS

		ENERGY	WATER	EQUITABLE DEVELOPMENT
COMMUNITY IDENTITY	ACCESS + MOBILITY	FUNCTION	HEALTH + WELL BEING	ACCESS + MOBILITY

Evolution of EcoDistricts

EcoDistricts are a strategy for integrating building and infrastructure projects with community and individual action. they offer a meaningful way to test and integrate neighborhood-based solutions that cities urgently need. Our approach is simple: use ecodistricts as public-private "eco-innovation zones" where the latest in business practices, technology and supportive public policy comes together to drive ambitious sustainability outcomes.

2008

Leaders in urban innovation identify EcoDistricts as the next big thing for cities

We set out to create an approach for building EcoDistricts that can be used around the world

We assemble an 80-person technical advisory committee and a mayor's sub-cabinet

We work with the City of Portland to identify 5 pilot districts + launch a pilot program

2010

We launch the first international EcoDistricts Summit with over 400 attendees

PoSI helps hire the country's first district-wide sustainability director (Lloyd EcoDistrict)

PoSI creates an energy roadmap for Portland's central city district

2012

We will roll out a north american capacity-building + pilot program

Examples of our work

Developing an integrated "smart" infrastructure strategy that helps ecodistricts identify ways to improve energy efficiency, cut greenhouse gases and attract investment

Developing a nonprofit consortium to bring bike-sharing to portland

Working with community leaders to create innovative ecodistrict governance frameworks

TABLE OF CONTENTS

Printed Resources

Electronic Resources

The following resources are available for download as a zipped file at:
http://www.pdxinstitute.org/index.php/resources/publications

ECODISTRICTS FRAMEWORK

The why, what and how of creating EcoDistricts

ECODISTRICTS ACTION GUIDE

Summary of the five phases of EcoDistrict development, as well as the four (4) ECODISTRICT TOOLKITS that PoSI developed to support them

PERFORMANCE & ASSESSMENT METHOD™

- Performance goals, metrics and methods for identifying project priorities
- EcoDistrict performance areas, goals and strategies, and metrics for baselining and measuring improvements
- Rigorous ten-step assessment approach to set project priorities

FINANCING

Resources for funding EcoDistricts from district organization through district monitoring

- Financing District Organization, Assessment and Monitoring: sources and types of funding to finance these phases of EcoDistricts activities
- Financing Feasibility and Small-Scale Project Development: various special-assessed and non-tax-assessed mechanisms to fund modest-sized projects
- Financing District Utilities and Other Large-Scale Project Development: offers various ways of financing infrastructure at the district scale

ORGANIZATION

Resources for engaging a community and developing a governance structure

- Engagement methods
- Governance structures

POLICY SUPPORT

Current regulatory challenges, precedent policies and recommended public actions to support EcoDistricts

- Survey of best practices
- Recommended short- and long-term public sector actions to support EcoDistricts
- Project specific recommendations

SNAPSHOTS

TEAMS & PROJECTS

FACULTY & FACILITATORS

STAFF

TEAM SNAPSHOT

Austin, Texas

GEORGE ADAMS

DEPUTY DIRECTOR, PLANNING AND DEVELOPMENT REVIEW DEPARTMENT, CITY OF AUSTIN

Neighborhood development experience 12 years from both a regulatory and urban design perspective
I want to learn about EcoDistrict benefits; particularly, how Portland tracks these benefits.
One challenge I'd like to address measuring the performance of compact, mixed use development versus conventional development.

LUCIA ATHENS LEED AP *team lead*

CHIEF SUSTAINABILITY OFFICE, CITY OF AUSTIN

Neighborhood development experience Community master planning for a Seattle redevelopment, Yesler Terrace; will create a Green Alley demonstration droject in East Austin's Guadalupe neighborhood
I want to learn about tools for governance with multiple property owners, resources and concepts for educating and engaging residents and business owners.
One challenge I'd like to address is how to bring together diverse players and interests to create synergy around the EcoDistricts concept, and increase commitment to sustainability overall.

FRED EVINS

SEAHOLM DISTRICT REDEVELOPMENT PROJECT MANAGER, ECONOMIC GROWTH & REDEVELOPMENT SERVICES DEPARTMENT, CITY OF AUSTIN

Neighborhood development experience Registered architect; 8 years working on the public-private redevelopment of underutilized city-owned land in downtown Austin
I want to learn about the EcoDistricts designation as well as its benefits and challenges.
One challenge I'd like to address is how to bring independent property owners together to form an effective EcoDistrict.

ROBERT HARRIS, FAIA, LEED AP

PARTNER, LAKE FLATO ARCHITECTS

Neighborhood development experience 25 years as an architect with planning and development projects at the community, neighborhood and project site levels
I want to learn about navigating the wide range of issues that impact planning and design at the district scale, identifying opportunities where urban projects overlap and breaking boundaries between public projects that fragment decision-making.

JOHN C. ROSATO

BOARD MEMBER, PRINCIPAL, SOUTHWEST STRATEGIES

Neighborhood development experience 30 years in commercial real estate; served as general partner in over 30 real estate partnerships; manages real estate acquisitions and leasing for Austin Travis County MHMR; managing partner of Seaholm
I want to learn about what an EcoDistrict looks like.
One challenge I'd like to address is how to find lenders who understand commercial restorations.

PROJECT SNAPSHOT

Seaholm District

The Seaholm District is a 16–acre redevelopment on the southwestern edge of downtown seeking LEED ND status, led by the City of Austin. At the site's heart is the historic and iconic Art Deco-style Seaholm Power Plant building, a decommissioned steam power plant that will undergo adaptive reuse to include major retail stores, restaurants, offices and a conference center. A new central library is being designed by Lake Flato Architects, and is slated for LEED Silver minimum in a new 200,000-square foot building. Other future development includes a hotel and 1,475 units of multi-family housing (apartments and condos). The project also inclues multi-modal transportation; complete streets, a Metro Rail stop, bus transit, bike sharing, car sharing, hike-and-bike trail connections and a five-mile cross-city route connecting with the Lance Armstrong Bikeway. Finally, Shoal Creek is a significant urban waterway that runs north-south through the city, culminating at Ladybird Lake. As such, stream bank restoration, habitat creation, native plantings and natural drainage are included in the plan. The project integrates benefits across the entire triple bottom line; it supports up to 2,000 jobs and integrates cultural facilities and significant art components. The ambitious plans complement Austin's successful policy and zoning efforts to bring more housing and commercial activity into the downtown area.

Why this neighborhood?

The Seaholm District is one of the City of Austin's signature public/private partnership redevelopment projects located in the heart of the city, with maximum visibility and a very high level of financial, political and community support. Plans are underway to include a Sustainability Information Center that will serve as the green concierge to the entire site, and staff offices for the Office of Sustainability. While much of the overall site has been planned, there is ample opportunity for the EcoDistrict concept to inform many design decisions and plans for how the neighborhood will be managed.

top 3 Neighborhood PRIORITIES:

1. Returning underutilized land to tax base while advancing urban design objectives, such as increasing downtown residential stock and retail offerings
2. Expanding transportation options while increasing walkability
3. Improving public assets (streetscapes, historic structures and natural green space)

top 3 Neighborhood CHALLENGES:

1. Securing buy-in of multiple property owners
2. Identifying funds to support innovative district-wide sustainable design elements
3. Facing developer reluctance to design changes since most of the district's projects are currently in design phase

TEAM SNAPSHOT

Bellingham, Washington

MARK BUEHRER, P.E.

FOUNDER, DIRECTOR + PRESIDENT, 2020 ENGINEERING (BELLINGHAM)

Neighborhood development experience 15+ years of planning in Bellingham; worked on LEED and Low Impact Development projects
I want to learn about how the legal structure for EcoDistricts is set up to allow property owners and residents within it to share resources, (i.e., transportation, energy, water, food, etc.).
One challenge I'd like to address is how to attract supportive developers who will implement sustainable strategies if the EcoDistrict concept is accepted by the local community and agencies.

LYDIA BENNETT CCIM, CPM *team lead*

BUSINESS DEELOPMENT DIRECTOR, ECONOMIC DEVELOPMENT LEAD, PORT OF BELLINGHAM

Neighborhood development experience 27 years in commercial real estate; served on community visioning project for the City's waterfront; working on 220-acre Waterfront District redevelopment
I want to learn about how to measure the costs and benefits of an EcoDistrict.
One challenge I'd like to address is how to communicate to the public the cost/benefit realities of an EcoDistrict and how to improve the public process for making these new ideas realistic.

SAM SHIPP, P.E. PROJECT ENGINEER, DEVELOPMENT SECTION, CITY OF BELLINGHAM

Neighborhood development experience 12 years with public infrastructure and private development; innovative technology projects: False Creek, Vancouver, B.C. and Dockside Green, Victoria.
I want to learn about EcoDistrict infrastructure optimization; best size of phased development in a city that is Bellingham's size; economic feasibility and critical mass for mass transportation.
One challenge I'd like to address is how to optimize phases and progression of infrastructure improvements to reduce the probability of expensive corrections.

ED SIMPSON

ASST. DIRECTOR, FACILITIES DEVELOPMENT & CAPITAL BUDGET, WESTERN WASHINGTON UNIV.

Neighborhood development experience Development of WWU Neighborhood Plan, WWU Institutional Master Plan and Happy Valley Neighborhood Plan
I want to learn about sustainable strategies for campus development in an urban setting.
One challenge I'd like to address is incorporating a higher education campus into an EcoDistrict with the city and waterfront areas.

MIKE STONER ENVIRONMENTAL DIRECTOR, PORT OF BELLINGHAM

Neighborhood development experience Led master planning for 220-acre Waterfront District redevelopment, which supported sustainable uses
I want to learn about successful examples of urban renewal projects that pre-installed utility corridors for phased development with district energy and integrated water reuse systems.
One challenge I'd like to address is how to plan for an EcoDistrict spanning a brownfield's redevelopment area and a fully developed central business district.

TARA SUNDIN

SPECIAL PROJECTS MANAGER, PLANNING & COMMUNITY DEVELOPMENT, CITY OF BELLINGHAM

Neighborhood development experience 15+ years in planning, coordination and implementation of community and economic development programs, including the Old Town District; led team on both the Waterfront District and Downtown master planning efforts
I want to learn about how to establish EcoDistrict boundaries.
One challenge I'd like to address is communicating the economics of EcoDistricts to the public.

PROJECT SNAPSHOT

Downtown/Old Town/Waterfront District

Bellingham's proposed pilot EcoDistrict is the commercial, retail, governmental and employment center of the city, which has faced a number of significant challenges in recent years. It includes Downtown, Old Town and a portion of the Waterfront District. Most of the major retailers left the central business district in 1988 to relocate to a 750,000-square foot regional mall, beginning a trend of suburban sprawl away from the city onto rural land. Bellingham's downtown waterfront was traditionally dominated by Georgia Pacific's (GP) 137-acre pulp, paper and chemical facility, but most of the waterfront was left vacant and contaminated when GP shut down operations at their chemical plant between 1999 and 2007. The pilot EcoDistrict neighborhood is bounded by a waterfront under transition from a heavy industrial brownfield to a mixed-use extension of downtown. Connections between the waterfront, Old Town and Downtown are critical.

The Port of Bellingham purchased all of GP's property in 2005 and partnered with the City of Bellingham to carry out the community vision of restoring the health of the land and water, improving waterfront access for the community, connecting downtown to the waterfront, promoting a healthy and dynamic waterfront economy and reinforcing the inherent qualities of each place on the waterfront.

The Port and City have committed major public investments in environmental cleanup and new parks, roads and infrastructure to support the transition of this heavy industrial property into a vibrant, mixed-use waterfront while continuing to support water-dependent activities.

Why this neighborhood?

This district supports our community's vision of transforming an abandoned asset into a beacon of local commitment towards a sustainable future centered around economic vitality and innovative design. The core of our City Center Master Plan is that the Old Town, Downtown and Waterfront districts will offer a mixed use of commercial, industrial and residential development. The district will minimize impacts to services, reduce sprawl, encourage economic development and maximize existing assets and infrastructure. The waterfront redevelopment site provides the unique opportunity to develop an extension of the existing city on a blank canvas and benefits from potential economies of scale associated with the concurrent development of new infrastructure.

top 3 Neighborhood PRIORITIES:

1. Understanding and communicating district-wide systems to the public and private sectors
2. Creating public access through our districts
3. Attracting a sustainable developer for the first phase of the waterfront redevelopment

top 3 Neighborhood CHALLENGES:

1. Developing an economic implementation strategy
2. Creating the EcoDistrict boundaries to ensure financial feasibility
3. Communicating the cost/benefit analysis to the public

TEAM SNAPSHOT

Boston, Massachusetts

BRIAN CASEY

DIRECTOR, GREENWICH ENERGY SOLUTIONS

Neighborhood development experience Works for the leading energy benchmarking and compliance service provider for large urban multi-family market participants; provides monthly energy monitoring, energy efficiency implementation and project management services inclusive of distributed energy generation and CHP

I want to learn about nationwide trends specific to benchmarking programs and requirements and available incentives and programs promoting distributive energy generation via CHP in concert with district energy systems.

One challenge I'd like to address is the transparency of technical and cost information from incumbent regulated utility providers for both traditional pipes-and-wire and district energy providers.

JIM HUNT *team co-lead*

CHIEF OF ENVIRONMENT AND ENERGY SERVICES, CITY OF BOSTON

Neighborhood development experience Oversees the City of Boston's environment department, the inspectional services department (buildings and codes), the energy office, and the parks and recreation department, all of which advance sustainable neighborhood development

I want to learn about district-wide energy efficiency programming for other cities that address both existing structures and new construction.

One challenge I'd like to address is improving collaboration between city, state and federal governances and private and public property owners in order to develop and execute a phased development at the district scale.

KATHY MacNEIL

PRINCIPAL + DEVELOPMENT MANAGER, MILLENNIUM PARTNERS

Neighborhood development experience Local real estate developer active in urban projects throughout Boston downtown areas

I want to learn about sustainability for Boston's Innovation District and how to use sustainability to attract companies and residents to this particular area.

One challenge I'd like to address is how to build and maintain sustainable environments when the competition for capital is so great, and how to make the payback more immediate.

KAIROS SHEN *team co-lead*

CHIEF PLANNER, BOSTON REDEVELOPMENT AUTHORITY, CITY OF BOSTON

Neighborhood development experience 18 years serving Boston's planning and economic development agency; planned and oversaw the development guidelines for Boston's Rose Kennedy Greenway, the green building zone plan, the Fenway Park refurbishment and the South Boston Waterfront Innovation District

I want to learn about how to apply climate adaptation strategies and how to incorporate district-wide energy facilities in the planning process.

One challenge I'd like to address is how other cities have funded, implemented, phased and aggregated their strategies, for both public and private partnerships.

PROJECT SNAPSHOT

Boston Innovation District

In January 2010, Mayor Thomas M. Menino announced the creation of the Boston Innovation District. The Innovation District comprises 1,000 acres and located within the South Boston Waterfront neighborhood district. Within this new district, the City is encouraging a mix of human capital by co-locating cutting edge growth industries; empowering designers and architects to create new modes of housing; and fostering an intentional place where people can be innovative.

The Innovation District is an exemplary model of sustainable urban planning and growth. The district resides on a landfill created over 100 years ago when the city was desperate for new real estate to support its growing industries and jobs. The Innovation District is the rebirth of this area, replacing industrial use that diminished over the last 60 years.

Billions of public dollars have been invested in highway access, public transit systems, airport expansion, new port infrastructure and civic buildings leading to significant private investment in the area creating Boston's new base of jobs for the city.

The Boston Innovation district is composed of five sub-districts: Fort Point, Seaport, Port, Convention Center and 100 Acres. Each sub-district has its own distinct character.

Why this neighborhood?

The South Boston Waterfront/ Innovation District is a fast changing district with new and adaptive reuse developments in previously underutilized areas where Boston is actively recruiting business from the innovative economy. The district master plans include new streets, parks and land uses in anticipation of the largest concentration of new construction Boston will see over the next few decades. It will serve as a model for how the new Boston is developed. Rich with public transit, Bus Rapid Transit, an adjacent subway and Boston's largest suburban rail station in Boston, the Innovation District has the right building blocks to construct a lasting model of an EcoDistrict for Boston and the region.

top 3 Neighborhood PRIORITIES:

1. Creating a 21st-century sustainable district with 20 million square feet of planned new buildings
2. Developing sufficient new, affordable residential units to create a community
3. Building a comptabile economic development strategy

top 3 Neighborhood CHALLENGES:

1. Integrating and adapting late 19th and early 20th century buildings
2. Addressing climate change adaptation and sea-level rise
3. Funding public infrastructure improvements

TEAM SNAPSHOT

Charlotte, North Carolina

AISHA ALEXANDER NEIGHBORHOOD RESOURCE MANAGER, CITY OF CHARLOTTE

Neighborhood development experience Sets the strategic vision and implementation plan for the City's youth, energy, environmental and community outreach and engagement programs; established and managed City of Philadelphia's Community EPIC Stakeholder Groups
I want to learn about how EcoDistricts can help to spur economic development and combat nutrition and hunger.
One challenge I'd like to address is how to engage and involve challenged communities.

TED BOYD CHARLOTTE CENTER CITY PARTNERS DIRECTOR, HISTORIC SOUTH END

Neighborhood development experience Project management and digital media expert; coordinates CCCP staff; works with the stakeholders in Historic South End
I want to learn about sustainability practices at the macro and micro levels to a neighborhood district.
One challenge I'd like to address is finding all of the current sustainable practices, buildings and effortsin order to chart a plan and tell the story.

DARLENE HEATER

VP OF NEIGHBORHOOD DEVELOPMENT & SPECIAL PROJECTS, CHARLOTTE CENTER CITY PARTNERS

Neighborhood development experience Works directly with urban neighborhoods to strengthen involvement; grew, developed and promoted brand awareness for Uptown and South End neighborhoods
I want to learn about key tactics to evolve a neighborhood into an EcoDistrict.
One challenge I'd like to address engaging short-term renter residents in community initiatives and neighborhood improvement activities.

MICHELLE MOORE

DEPUTY DIRECTOR OF SOLID WASTE SERVICES, CITY OF CHARLOTTE

Neighborhood development experience Over 20 years with the City of Charlotte and Mecklenburg County; managed the transition to single-stream recycling for Charlotte.
I want to learn about approaches taken in other cities to engage the community.
One challenge I'd like to address is how to balance economic and environment values in order to make the business case for environmental initiatives.

ROB PHOCAS, JD, MEM ENERGY & SUSTAINABILITY MANAGER, CITY OF CHARLOTTE

Neighborhood development experience Oversees the City's environmental and energy efficiency programs; helped to develop new environmental variables to be included in the 2012 Quality of Life Study
I want to learn about different projects and partnerships constituting a successful EcoDistrict.
One challenge I'd like to address is identifying and establishing partnerships to achieve sustainability initiatives.

NICOLE R. STOREY, AICP *team lead*

COMMUNITY ENERGY CONSERVATION COORDINATOR, CITY OF CHARLOTTE

Neighborhood development experience 15 years specializing in the physical, social and economic development of communities; responsible for the development and administration of neighborhood, commercial and multi-family community-based sustainability programs
I want to learn about communicating sustainable practices and providing funding and financing.
One challenge I'd like to address is moving forward with new neighborhoods without grant funding.

PROJECT SNAPSHOT

South End District

Located south of uptown Charlotte, the South End area was established in the 1850s along Charlotte's very first railroad. South End quickly thrived as a manufacturing center until the 1970s when its booming factories and textile mills experienced a sharp decline.

The South End (or Historic South End) is a mixed-use neighborhood featuring a variety of shops, restaurants and markets within walking distance to residents and employees. Contributing to South End's renaissance is its designation as a Municipal Service District (MSD). Established in 1999, the MSD manages an incremental property tax, which is reinvested in the district.

Paramount to the area's renaissance is Charlotte's first light rail line, the LYNX Blue Line, which connects people to jobs, shopping and recreation. The Blue Line accommodates roughly 15,000 daily riders and provides four light rail stations within the District.

Why this neighborhood?

Charlotte's Historic South End neighborhood is a community with a rich history of innovation. Once a center of Charlotte's manufacturing and mills, the community has transformed into a hub of strong retail, entertainment and housing through leveraging Brownfield Economic Redevelopment funds.

The South End attracts a young population that embraces elements of a sustainable lifestyle: riding light rail, walking to convenient commerce and supporting the local-food economy.

As a Municipal Service District (MSD), the South End community pays a surtax to receive additional staff support for their initiatives. They have contracted with Charlotte Center City Partners (CCCP) for this support, giving the community the human and financial resources to manage and implement a sustainability plan and resulting initiatives. The neighborhood includes more than 3,000 dwelling units and hundreds offices, retail and other non-residential structures. Redevelopment of these areas could present opportunities for common open space elements, providing recreational opportunities and pedestrian safety.

top 3 Neighborhood PRIORITIES:

1. Establishing Historic South End as a nationally, if not internationally, recognized EcoDistrict
2. Creating a toolbox of strategies that can be utilized in Historic South End as well as replicated in future EcoDistrict neighborhoods
3. Establishing "buy-in" from residents and the business community to ensure the long term success of the EcoDistrict initiative

top 3 Neighborhood CHALLENGES:

1. Finding mechanisms to encourage and incentivize reinvestment in existing properties to be more efficient and to develop "green" amenities & services
2. Communicating benefits and establishing "buy-in" from residents and the business community to ensure the long term success of the EcoDistrict Initiative
3. Identifying funding including grants, local funding and partnerships to fully implement the selected sustainability initiatives

TEAM SNAPSHOT

Cleveland, Ohio

THOMAS JORDAN

NEIGHBORHOOD PLANNER, CLEVELAND CITY PLANNING COMMISSION

Neighborhood development experience GIS analyis of neighborhood trends and the impact of specific programs
I want to learn about local food economies.
One challenge I'd like to address is convincing political leaders who make budget decisions that we desire more walkable/bikeable neighborhoods, and that they are necessary to build sustainable communities.

JENITA McGOWAN *team co-lead*

CHIEF OF SUSTAINABILITY, CITY OF CLEVELAND

Neighborhood development experience Community organizing for a Cleveland-based grassroots grant-maker; conducted community conversations around the topic of healthy food access; worked with neighborhood leaders in planning and participating in sustainability programs
One challenge I'd like to address is how to make sure that the plans for EcoDistricts are based in neighborhood self-determination.

MICHELLE MULCAHY *team co-lead*

PROGRAM OFFICER, ENTERPRISE COMMUNITY PARTNERS

Neighborhood development experience Leads sustainability efforts; provides technical help to affordable housing developers; led planning and community engagement effort in Washington, D.C.
I want to learn about financing strategies; district-scale energy generation; public policies that support the development of EcoDistricts and low-cost branding.
One challenge I'd like to address is how to support the creation of EcoDistricts in weak market cities.

ANGELA SHUCKAHOSEE

DIRECTOR OF COMMUNITY INVOLVEMENT, DETROIT SHOREWAY COMMUNITY DEVELOPMENT ORG.

Neighborhood development experience Constituency and community development; community outreach; event planning; vacant land reuse; project management and safety coordination
I want to learn about how to integrate residents of all walks of life into sustainable practices and how to create a sense of place for the EcoVillage.
One challenge I'd like to address is educating residents who are apathetic to the idea of an "ecovillage."

JEFFREY SUGALSKI

REAL ESTATE DEVELOPMENT MANAGER, BURTEN, BELL, CARR DEVELOPMENT, INC

Neighborhood development experience 10 years of experience working in neighborhood development; works with grassroots groups that use bikes as a neighborhood development catalyst
I want to learn about the implementation of Portland's sustainability projects, specifically about available resources, political support and community engagement.
One challenge I'd like to address is how I may better encourage bicycle and transit improvements in Cleveland and change leaders' attitudes about multi-modal transportation.

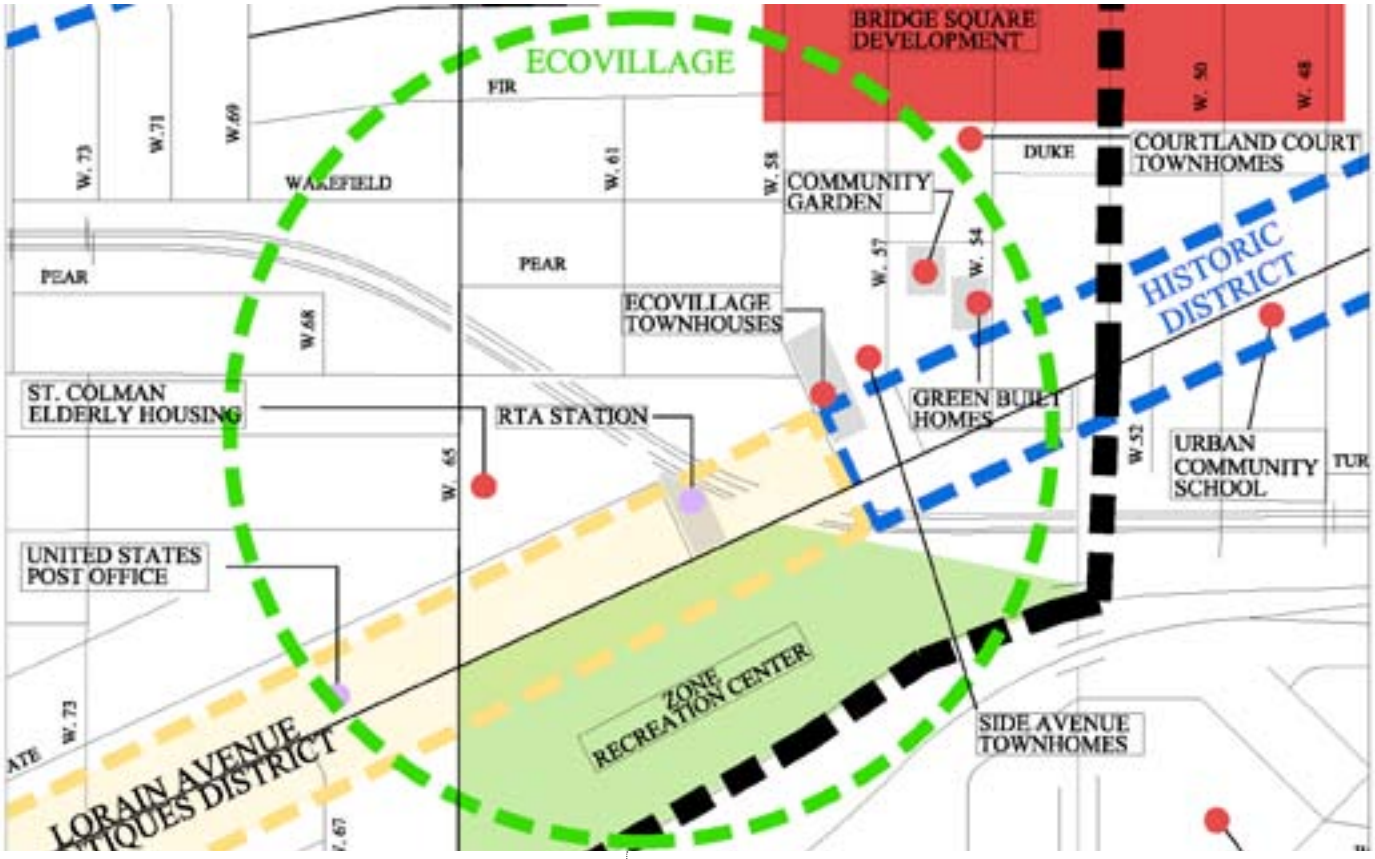
LILAH ZAUTNER

SUSTAINABILITY MANAGER, NEIGHBORHOOD PROGRESS

Neighborhood development experience 10 years in community development; developed environmental education programs (focus on waste reduction) and summer programs for Cleveland inner-city parks; transportation and infrastructure programs, green building/housing and community interdependence
I want to learn about similar district- or community-wide stewardship and sustainable living programs.
One challenge I'd like to address is how can we respect and promote self-determination at the neighborhood scale while continually progressing toward regional sustainability goals.

PROJECT SNAPSHOT

Cleveland EcoVillage



The Cleveland EcoVillage was founded in 1998 through a collaboration between Detroit Shoreway Community Development Organization (DSCDO) and EcoCity Cleveland. With initial funding by the U.S. Environmental Protection Agency, the EcoVillage is a national model for revitalizing a built neighborhood centered around a light rail station. DSCDO has focused on community engagement through education, urban agriculture, and resident-led neighborhood improvement activities. The EcoVillage is home to roughly 6,000 residents in a diverse community that has a 25 percent Hispanic population and a robust African refugee community.

The neighborhood is a low to moderate income community with a poverty rate of 38 percent. Many young professionals have purchased homes in the EcoVillage in the past decade. DSCDO and private and non-profit partners have spurred over $24 million of development for the EcoVillage and another $12 million is planned in the near future. Over 400 housing units have been completed with many that heat and cool for $400 annually. The $3.1 million exterior improvement to the 22-acre Zone Recreation Center combines sustainable and eco-friendly green space improvements with recreational amenities.

Why this neighborhood?

The Cleveland EcoVillage has a long history as an EcoDistrict but has struggled in recent years to maintain momentum, particularly as the foreclosure crisis and weak economic conditions continue. We look forward to exploring creative strategies to reinvigorate the area.

top 3 Neighborhood PRIORITIES:

1. Stabilizing real estate market
2. Developing commercial properties
3. Branding the EcoVillage

top 3 Neighborhood CHALLENGES:

1. The past 5 years: 22 percent foreclosure rate and 6 percent of all houses were demolished. Now, 4 percent of all houses are vacant and abandoned; others are in substandard condition.
2. Vacant/blighted commercial buildings; abundance of used car lots.
3. Lack of identity/branding

TEAM SNAPSHOT

Guadalajara, Mexico

HÉCTOR CASTAÑÓN REYES

INDEPENDENT CONSULTANT IN DEVELOPMENT PLANNING AND MANAGEMENT, PLAN V

Neighborhood development experience Participatory planning and management; urban development and regeneration plans; public policy analysis on socio-urban issues; technical coordination for the City of Guadalajara's development plan.
I want to learn about methodologies for sustainable neighborhood planning, other examples of project development and management at the neighborhood level, and financial strategies for neighborhood development.
One challenge I'd like to address is political will and how to communicate sustainable urban development advantages by exposing externalities and identifying long term benefits.

MARÍA ELENA DE LA TORRE

INDEPENDENT CONSULTANT, URBAN PLANNING & SUSTAINABLE MOBILITY, CIUDAD PARA TODOS

Neighborhood development experience Independent consultant on issues of mobility, landscape and city planning; participatory coordination for multiple community workshops; participates in street actions with civic organizations
I want to learn about successful examples of sustainable neighborhoods engaging local authorities in the sustainable renewal of neighborhoods in a sustainable manner and empowering local residents for neighborhood development.
One challenge I'd like to address is how to raise funding from local and international stakeholders.

MARIO RAMÓN SILVA

COORDINATOR FOR HEALTHY CITIES AND URBAN MOBILITY, COLECTIVO ECOLOGISTA JALISCO

Neighborhood development experience Assessing urban air quality and its impact on livelihood; promoting non-motorized transportation; monitoring urban transport quality.
I want to learn about successfully replicating methodologies, lobbying and communication strategies.
One challenge I'd like to address is how to engage the public and deal with resistance to change.

ALFREDO HIDALGO RASMUSSEN *team lead*

DIRECTOR, CENTRO DE INFOTECTURA Y TECNOGÍA APLICADA

Neighborhood development experience Public space renewal and construction projects; organized the first international forum for architecture in Guadalajara, later named COM:PLOT, celebrating an international event each year based in Guadalajara; member of the Commission for the Metropolitan Coordination for Planning
I want to learn about successful methodologies, urban intervention strategies and public architecture.
One challenge I'd like to address is how to achieve common understanding.

PROJECT SNAPSHOT

Vallarta Sur

Located west of Guadalajara, Vallarta Sur is a small fragment of the city resulting from urban expansion in the 1950s. The renewal project for the neighborhood aims to transform the railway right-of-way into a linear park that would help bring community cohesion, overall renewal and improve the quality of life for the neighborhoods along the railway.

The renewal project started when civic groups joined together to protest an elevated highway planned by city authorities through the railway line in 2010. When the project was cancelled due to local opposition, residents hoped to improve the area with a linear park as an anchor of social and urban transformation.

Since then, residents have worked to clean and improve the area to encourage the authorities to designate the right-of-way as a as non-motorized linear park. As a result of this effort, local organization "Citizen Synergy" emerged to coordinate the appropriation of the public space for citizens through different weekly activities that involve neighbors and visitors of all ages.

Since 2009, the area has undergone development by the local government that includes landscaping, improving pedestrian crossings across the railway, and creating bike lines. However, this development has not completely materialized. Now, neighbors are concerned about the growing problems that affect the daily life of local residents such as crime, a lack of security, increased traffic, and changes in land use.

Why this neighborhood?

This neighborhood symbolizes citizen action for a more sustainable city. The social cohesion that emerged to stop the highway led to a strong local effort to keep the space public and to debate the future plans for the area. Stakeholders could promote sustainable management and neighborhood renewal because there is strong leadership among them to improve their environment.

Now neighbors, some local universities and civic organizations are assessing the area on land use, mobility, infrastructure, social perception in security and social cohesion.

top 3 Neighborhood PRIORITIES:

1. Keeping land uses that benefit housing and increase housing density
2. Improving security and social cohesion
3. Establishing public space and sustainable mobility

top 3 Neighborhood CHALLENGES:

1. Legal uncertainty over the management of the green space that results from the railway right of way, which is currently managed by the national railway company, FERROMEX
2. Avoiding changes in land use and the exodus of housing
3. Managing mobility and reducing traffic

TEAM SNAPSHOT

Mountain View, California

MARTIN ALKIRE *team lead*

PRINCIPAL PLANNER, COMMUNITY DEVELOPMENT DEPARTMENT, CITY OF MOUNTAIN VIEW

Neighborhood development experience Economic development issues; neighborhood development through public planning processes; General Plan and zoning update projects in cities in Santa Clara County
I want to learn about sustainability management associations; how they can be formed and operated so that they effectively include the City and diverse stakeholders; so that the City can play a role in supporting them; and so that they can implement district-wide transportation solutions.
One challenge I'd like to address is how the city can help incentivize investment in an EcoDistrict that benefits the community and its many stakeholders.

ELLIS BERNS

ASSISTANT COMMUNITY DEVELOPMENT DIRECTOR, COMMUNITY DEVELOPMENT DEPARTMENT, CITY OF MOUNTAIN VIEW

Neighborhood development experience Neighborhood development through public planning processes; General Plan and zoning update projects in cities in Santa Clara County
I want to learn about the infrastructure behind an EcoDistrict; how private parties and the City would create and maintain it, and the technologies in sustainable energy, water and solid waste that would be involved.
One challenge I'd like to address is creating legal, financial and other agreements as related to the use and sharing of a district-wide utility system.

ALISON TURNER

UTILITIES SERVICES MANAGER, PUBLIC SERVICES DEPARTMENT, CITY OF MOUNTAIN VIEW

Neighborhood development experience Enforcing state and local codes/requirements for municipal water, sewer and stormwater servicing and infrastructure; ensuring future adequacy of systems, at most efficient cost to rate payers.
I want to learn about the operation of EcoDistricts; what costs, equipment and training are necessary for the"new street design"; the differences between water demands and wastewater generation compared to conventional systems.
One challenge I'd like to address is aging or deficient infrastructure replacement in narrow, limited corridors, such as adding a recycled water service to already impacted corridors.

PRIVATE PARTNER

GEORGE SALAH

DIRECTOR OF REAL ESTATE & WORKPLACE SERVICE, GOOGLE

George Salah has 22 years of corporate real estate and construction management experience. George has a deep commitment to environmental responsibility with particular focus on occupant health. At Google, Inc., George provides vision and leadership, using unconventional synergistic teams to achieve innovative results.

PROJECT SNAPSHOT

North Bayshore

Figure 2: North Bayshore Area

Mountain View is in the heart of Silicon Valley, an established major metropolitan region in Santa Clara County. The city's local economy is based largely on technology companies, many of which started in Mountain View and benefitted from the concentration of educated workers and proximity to Stanford University.

The North Bayshore area borders Palo Alto to the west; Highway 101 to the southwest; Stevens Creek and the federally-owned NASA Ames to the east; the Shoreline at Mountain View Regional Park and San Francisco Bay to the north. Access to the area is limited, since few roadways that connect the area with the rest of the city.

The area is approximately 645 acres (not including the 650 acre Shoreline at Mountain View Regional Park) and is home to some of the world's leading technology companies. The area includes over 7 million square feet of office parks with about 20,000 employees; and also includes an attractive natural setting, with San Francisco Bay access, marshes, creeks, trails, and wildlife habitat.

The City has a dynamic General Plan strategy for the area, and is already working on specific development standards through its Precise Plan work. From the private market side, there is tremendous demand for office space in North Bayshore and in Mountain View in general. The higher allowed development intensities of up to 1.0 floor area ratio (FAR) for this area would provide the incentive and resources for private companies to make their projects feasible and implement the community's sustainability vision and goals for the area.

Sustainability is envisioned to drive change in North Bayshore into the future, and continue its status as a leading center of innovation and growth. The capital resources of North Bayshore these stakeholders and their shared interest in collaborating with others and the City will help implement EcoDistrict concepts into reality.

Why this neighborhood?

The Mountain View community is interested in both developing the North Bayshore area—an outdated area in need of substantial new planning and improvements—in a highly sustainable manner and leveraging its key assets to significantly improve the area. The 2030 General Plan emphasizes North Bayshore's natural amenities, economic strength and future as a sustainable "campus" environment. Joining the General Plan update process, major stakeholders share many of these same values. The City is developing plans for potential EcoDistrict pilot projects. To aid this new development, the City can leverage its large land-holdings and its SRPC resources to lead change in the area.

top 3 Neighborhood PRIORITIES:

1. Maintaining and enhancing the area's unique natural features, amenities and character
2. Implementing the General Plan and the community's future vision for innovative sustainable change
3. Forming a sustainable management association (SMA) to help plan new or upgraded area transportation and utility infrastructure

top 3 Neighborhood CHALLENGES:

1. Supporting area change and growth while not worsening area transportation conditions
2. Achieving measurable increases in pedestrian, bicycle and transit use to and within the area
3. Constrained public right-of-way area for transportation and utility improvements

TEAM SNAPSHOT

Philadelphia, Pennsylvania

ALEX DEWS, LEED AP BD+C *team lead*

POLICY AND PROGRAM MANAGER, MAYOR'S OFFICE OF SUSTAINABILITY

Neighborhood development experience Worked in real estate development in Philadelphia
I want to learn about how other cities are beginning to implement their EcoDistrict plans.
One challenge I'd like to address is how to maintain and institutionalize the current successful sustainable planning initiatives for the long term, as the current mayor will soon complete his final term.

RICHARD ROARK, RLA, ASLA, LEED AP BD+C

PARTNER, OLIN LANDSCAPE ARCHITECTURE/URBAN DESIGN/PLANNING

Neighborhood development experience Practicing landscape architecture while taking multi-cultural roots of Philadelphia's neighborhoods into consideration; family- and community-orientated housing frameworks
I want to learn about defining metrics for urban sustainability and establishing feedback loops that measure success through everything from quality of life to environmental quality.
One challenge I'd like to address is how to measure sustainability at the urban scale when it lacks a common metric or applicable performance system.

NATALIE SHIEH, LEED AP BD+C

PROGRAM MANAGER OF THE NEW ZONING CODE,
OFFICE OF THE DEPUTY MAYOR FOR ECONOMIC DEVELOPMENT

Neighborhood development experience Served as program manager of the zoning code reform effort for the City of Philadelphia, which supports Philadelphia's compact, pedestrian-friendly and mixed-use development patterns

BENNUR KOKSUZ

DIRECTOR OF DEVELOPMENT, PHILADELPHIA REDEVELOPMENT AUTHORITY

Neighborhood development experience Responsible for land aggregation, large-scale development, plan review, and the One Percent for Art program; worked as director of urban design for the Philadelphia City Planning Commission and senior deputy director of City the San Diego City planning department.

JESSICA NOON

STRATEGIC POLICY AND COORDINATION, OFFICE OF WATERSHEDS, CITY OF PHILADELPHIA

Neighborhood development experience Consultant for neighborhood redevelopment planning; reviewed individual development plans as a city planner; participated as a resident in neighborhood planning exercises; works to influence positive neighborhood development as an activist in my community.
I want to learn about the development of EcoDistricts in other cities and the reason to focus on a particular district.
One challenge I'd like to address is how to develop green infrastructure infiltration processes in highly dense areas like South of South, where there are many utility conflicts in the right of way and very little open space exists.

PROJECT SNAPSHOT

South of South

South of South neighborhood is a diverse and vibrant community located within walking distance to the city center. The pilot neighborhood is home to the South of South Neighborhood Association (SOSNA), a strong community organization with proven capacity to successfully plan and implement sustainability projects. SOSNA is supporting Carpenter Square, a mixed-use development located at the intersection 17th & Carpenter Streets, currently an underutilized vacant lot owned by the Philadelphia Redevelopment Authority. The project will include eleven townhomes, six condos, 2,000 square feet of commercial/retail space, and a public plaza. The development team intends to certify the rowhomes through the LEED for Homes program. In addition, they are seeking certification for the entire project under the LEED-ND program, which will be further supported by a three-day charrette led by Global Green in June.

The City of Philadelphia team selected South of South as one of the many neighborhoods in the city where creative development is happening, and feels that this location is representative of many other locations. All face similar challenges in sustainable urban development and have similar opportunities to leverage existing community networks, transit and utility infrastructure and conditions in the built environment.

Why this neighborhood?

The densely-developed neighborhood's central location and proximity to amenities make it an ideal candidate. It is close to the Schuylkill River Park and Trail, University City (home to the University of Pennsylvania and Drexel University), restaurants and retail outlets along South Street, the Avenue of the Arts on Broad Street and the historic Italian Market.

Filled with architecturally significant buildings, the area has drawn a mix of long-time and new residents; and working professionals and young families. Grassroots efforts from residents are working to support their local elementary schools and increase community engagement.

top 3 Neighborhood PRIORITIES:

1. Implementing Philadelphia2035, Greenworks, and Green City, Clean Waters in such a way that actively engages the SOSNA neighborhood
2. Focusing on equitable land use planning, sustainable infrastructure implementation and appropriate new development strategies
3. Developing a replicable model to scale this across Philadelphia

top 3 Neighborhood CHALLENGES:

1. Engaging with the community better
2. Balancing development with gentrification
3. Implementing infrastructure repair/replacements

TEAM SNAPSHOT

San Francisco, California

CAL BROOMHEAD

ENERGY PROGRAMS MANAGER, SAN FRANCISCO DEPARTMENT OF ENVIRONMENT

Neighborhood development experience Designed a door-to-door sustainability education campaign; developed small business energy program with 30+ neighborhoods; led solar and home energy workshops
I want to learn about metrics for long term governance.
One challenge I'd like to address is financing infrastructure developments in underdeveloped areas.

JOSE CAMPOS

DIRECTOR OF CITYWIDE PLANNING, SAN FRANCISCO PLANNING DEPARTMENT

Neighborhood development experience Responsible for adoption of redevelopment project areas; managed San Diego Redevelopment Agency; led San Diego Livable Neighborhoods Project.
I want to learn about district-level green energy infrastructure financing.
One challenge I'd like to address is effectively getting property owners and developers to agree to legal and financing agreements to install district energy and heating infrastructure.

MARLA JUROSEK

PLANNING & REGULATORY COMPLIANCE DIVISION MANAGER,
SAN FRANCISCO PUBLIC UTILITIES COMMISSION, WASTEWATER ENTERPRISE

Neighborhood development experience Manages, develops and implements stormwater and wastewater policies; educates on stormwater and wastewater green and grey infrastructure.
I want to learn about performance metrics for district-scale water and wastewater management.
One challenge I'd like to address is validating ratepayer investment in a decentralized infrastructure for a dense urban area with an existing centralized infrastructure.

PAULA KEHOE

WATER RESOURCES DIVISION MANAGER, SAN FRANCISCO PUBLIC UTILITIES COMMISSION

Neighborhood development experience Manages the siting and stakeholder involvement process for recycled water and groundwater facilities within the City and County of San Francisco.
I want to learn about cost effective alternate water source collection and treatment systems for large-scale commercial and mixed-use residential developments and districts.
One challenge I'd like to address is sharing alternate water sources for non-potable use with property owners.

KATE McGEE

LEAD SUSTAINABILITY PLANNER, SAN FRANCISCO PLANNING DEPARTMENT

Neighborhood development experience Managed the implementation of two EcoDistricts in San Francisco; improved business opportunities through a non-profit residents association; policy development
I want to learn about key drivers necessary to support EcoDistrict implementation.
One challenge I'd like to address is information-sharing and asset management for our forthcoming public-private partnerships and sustainable management association.

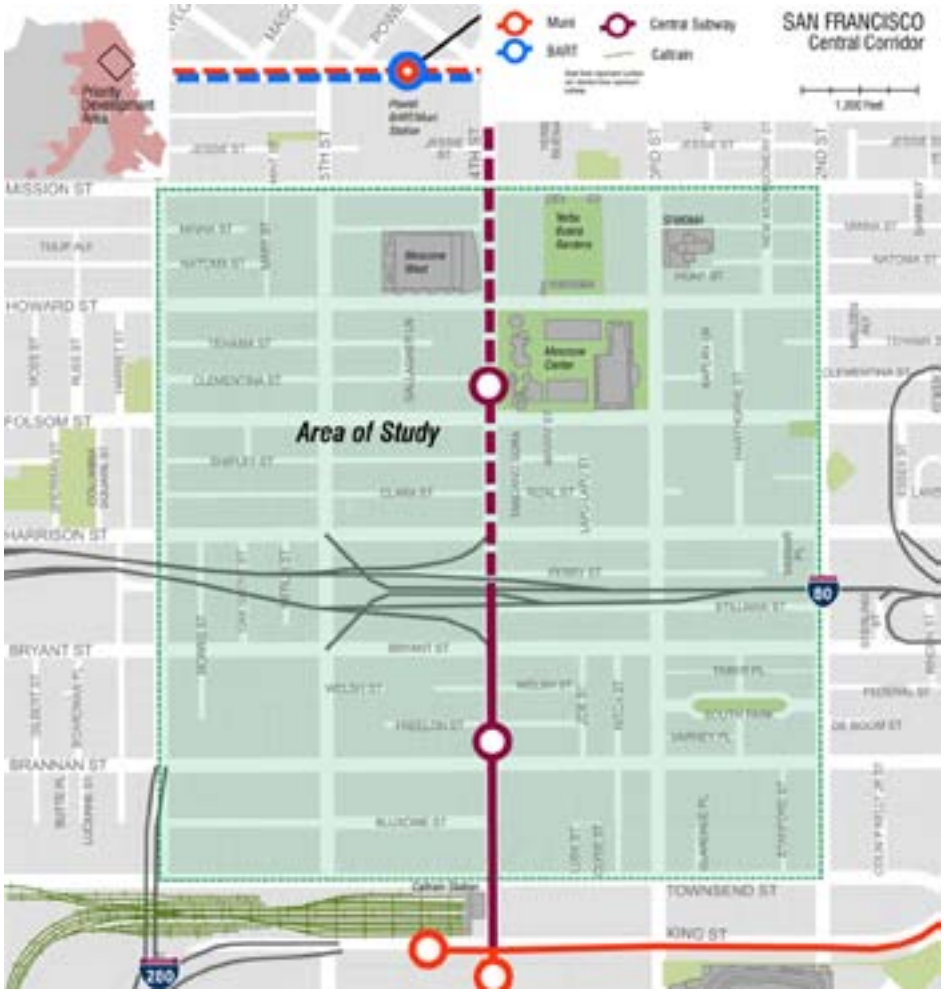
MANUEL RAMIREZ

MANAGER, STRATEGIC & LONG-TERM PLANNING,
SAN FRANCISCO PUBLIC UTILITIES COMMISSION, POWER ENTERPRISE

Neighborhood development experience Researches district-level net-zero energy approaches; developed energy feasibility and long-term GHG-free energy plans
I want to learn about approaches to district-level energy infrastructure, particularly district heating.
One challenge I'd like to address is how cities partner with developers to effectively build energy infrastructure to support micro-grids.

PROJECT SNAPSHOT

Central Corridor



The "Central Corridor" area is a 24 square block area south of Market Street, from Mission Street to Townsend, and from 2nd Street to 6th Street that includes the CalTrans train station, a freeway and the Moscone Convention Center. This once-industrial area is now positioned to become a growing center of the city's and region's high-tech industry. With the construction of the Central Subway (scheduled to begin operation in 2018), undeveloped or underdeveloped parcels in the corridor offer significant development opportunity. The Central Corridor Plan will propose rezoning this area for dense, transit-oriented, mixed-use growth and hopes to capitalize on rezoning to incorporate district-level energy and water infrastructure.

Currently, the City's Planning Department has been charged with creating a district plan and has successfully developed an integrated community vision for the southern portion of the district. These proposed changes are based on a synthesis of community input, past and current land use efforts, and analysis of long-range regional, citywide and neighborhood needs. Significant up-zoning from industrial to commercial and high-rise residential is also currently proposed for the area. The expectation is that up-zoning will enable development of office space, which is in high demand in this part of town. Additionally, public realm improvements and the expansion of the subway line will also help to promote building improvements. The pace of that change will depend on the economy; yet, any requirements placed into the plan now will be realized over time.

Why this neighborhood?

The Central Corridor neighborhood has been selected because the timing is right for integrating neighborhood scale improvements into the Plan. Planning is nearly complete and the project is about to commence the Plan's EIR, which will include EcoDistrict concepts. Success in implementing this plan is assured because the Central Corridor project has strong support from the City's elected officials and the community.

top 3 Neighborhood PRIORITIES:

1. Capturing opportunities from the new Muni light rail line construction (i.e., new fiber optic line, recycled water, district heat); and from the current upzoning that will bring jobs, residents and hotels
2. Learning lessons from the expansion and upgrading of the Moscone Convention Center
3. Identifying the opportunities for the areas below the existing freeway and some City-owned properties for public amenities, green space, storm water storage, art, etc.

top 3 Neighborhood CHALLENGES:

1. Unifying an area with multiple interest zones, different interest groups and unique needs and interests
2. Changing code may be necessary to move ground water across properties in response to the fact that 55 million gallons/year of ground water is pumped out of the area into the sewer
3. Financing major infrastructure such as a district energy system, when the area will be redeveloped over a long period of time

TEAM SNAPSHOT

Vancouver, B.C. (UBC)

LISA COLBY *team lead*

DIRECTOR, POLICY PLANNING, CAMPUS AND COMMUNITY PLANNING, UNIVERSITY OF BC

Neighborhood development experience 25+ years as professional planner (residential, commercial, institutional, industrial); currently responsible for long range land-use planning on UBC campus
I want to learn about the latest innovations in planning and delivering sustainable neighborhoods.
One challenge I'd like to address is how to keep the sustainability vision on track as future generations take the reins.

KERA McARTHUR

DIRECTOR OF PUBLIC ENGAGEMENT, CAMPUS AND COMMUNITY PLANNING, UNIVERSITY OF BC

Neighborhood development experience Managed consultation on land use, including Land Use Plan amendment and neighborhood planning processes; spent six years on the board of Think City, a non-profit organization focusing on civic engagement in Vancouver
I want to learn about innovative public process that engages residents in the development of EcoDistricts.
One challenge I'd like to address is building public acceptance for densification as a sustainability practice.

ANDREW PARR

MANAGING DIRECTOR, STUDENT HOUSING AND HOSPITALITY SERVICES, UNIVERSITY OF BC

Neighborhood development experience Managed operations of over 9,000 student residence beds over two campuses; worked on the Campus Master Plan and Acadia Park and Gage South Neighborhood plans.
I want to learn about creative, sustainable, diverse and highly liveable neighborhood developments.
One challenge I'd like to address is marrying highly sustainable neighborhoods with liveability—combining all of the elements of a sustainable environment with balanced with financial viability and the development of a highly desirable living environment to a diverse population.

SIU TSE

ASSOCIATE DIRECTOR, INFRASTRUCTURE AND SERVICES PLANNING,
CAMPUS & COMMUNITY PLANNING, UNIVERSITY OF BC

Neighborhood development experience Develops utility master servicing plans and growth-related infrastructure programs; reviews Stormwater Management Plan and Erosion and Sediment Control Plan for numerous construction projects; helped develop neighborhood plans and the Official Community Plan
I want to learn about how to encourage developers to provide "cost effective" developments in an EcoDistrict.
One challenge I'd like to address is convincing developers to finance sustainable features, which are often perceived as a high-cost luxury requests.

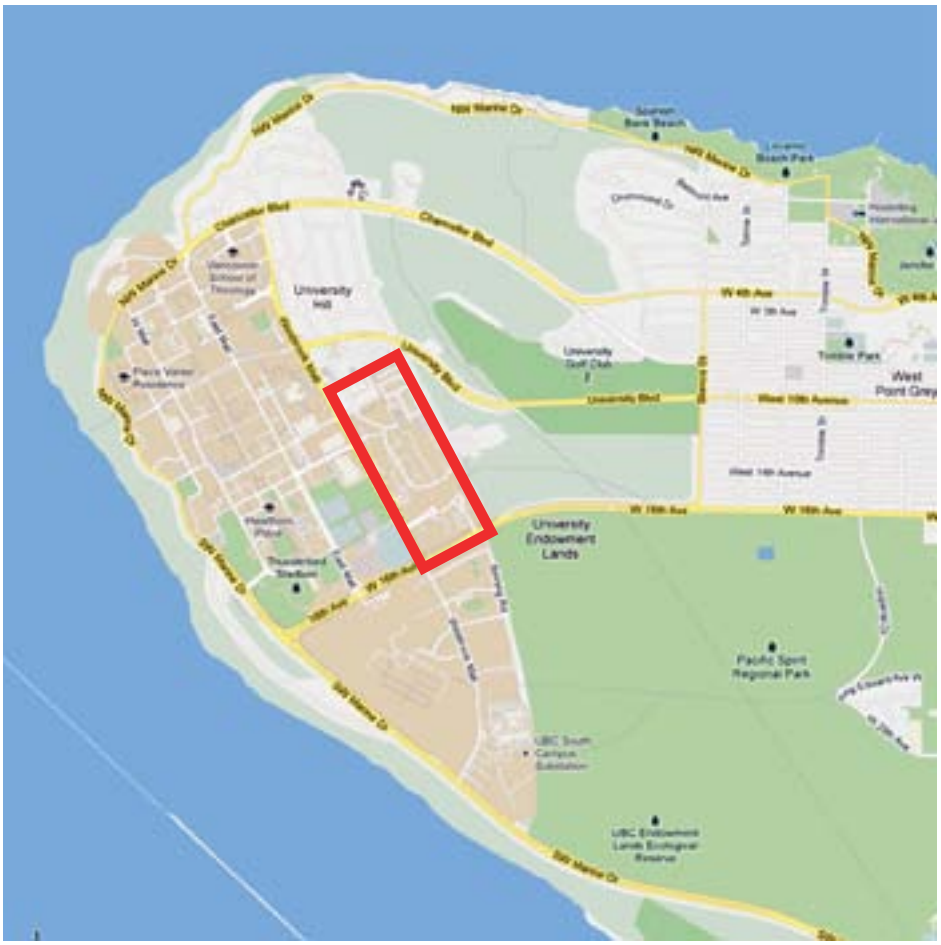
PAUL YOUNG

DIRECTOR OF PLANNING & DESIGN, UBC PROPERTIES TRUST

Neighborhood development experience 30+ years of planning and implementing large-scale neighborhood and community development projects; created and implemented detailed plans for BC's Lower Mainland metropolitan area; designs and implemens initiatives for a sustainable community of 25,000 residents at UBC
I want to learn about aspects of building sustainable communities that maximize ecological and community benefits without driving up development costs or creating overly-complex building systems.
One challenge I'd like to address keeping the goals of sustainable living environments simple, affordable and robust; homebuyers are already willing to "go green", but inherently distrust complex building systems and open-ended cost implications for maintaining those systems.

PROJECT SNAPSHOT

Acadia Neighborhood



Acadia Neighborhood is one of seven residential neighborhoods University of British Columbia (UBC) is developing for faculty, staff, students and the general public. Through the creation of this residential community on our campus, UBC is building a more complete campus community with a good range of shops, services, transit and amenities.

With less commuting and more proximate living, our faculty and students will enjoy better engagement with the campus and academic success while lessen their impact on our neighbors and reducing greenhouse gas emissions.

The Acadia neighborhood is the oldest neighborhood on campus with aging low-density housing stock due for replacement in the coming years. UBC will seek to redevelop it as a model sustainable neighborhood, consistent with the vibrant university community vision and sustainable community growth objectives of the recent Vancouver Campus Plan and UBC Land Use Plan. It will be developed at a higher density than today—possibly up to a net floor space ratio of 3.5.

Why this neighborhood?

Acadia is an ideal location for a pilot EcoDistrict from a timing, scale, mission and innovation perspective. The area's anticipated whole-scale renewal and planned change presents a unique opportunity for UBC to advance sustainability across all systems at a neighborhood scale, using the EcoDistrict framework. We hope to begin the neighborhood planning process over the next year, and to stay abreast of the latest expertise on sustainable community building and to better understand the EcoDistrict framework. We are committed to assuming a responsible leadership role in sustainable development in our own operations.

top 3 Neighborhood PRIORITIES:

1. Establishing a shared vision for Acadia founded on strong technical analysis and meaningful community input.
2. Implementing truly innovative, effective, and 'Living Lab' approaches to sustainable community design where we can test, research and teach about sustainability at the same time.
3. Fostering a sense of community and social cohesion among the diverse population planned to live in this neighborhood, including staff, faculty, students and members of the general public.

top 3 Neighborhood CHALLENGES:

1. Phasing and engagement of this new development will be important so that the community sees the change as positive. Balancing the different needs/expectations of a diverse community composed of students, staff, faculty and the public
2. Adding significant density while maintaining livability and a family-friendly environment is extremely important
3. Helping people be a part of the innovation along the way so we gain their support and committment, which will hopefully encourage them to sustain it as they assume control in strata corporations and local governance organizations

FACULTY+FACILITATOR SNAPSHOTS

ELIOT ALLEN, AICP, LEED AP-ND, CNU-A

FACULTY

PRINCIPAL, CRITERION PLANNERS

Eliot Allen is a nationally-recognized leader in the use of performance measures to help inform and guide sustainability planning at neighborhood, community and regional scales. Since 2007, Eliot has been the US Green Building Council's primary technical consultant for development of the LEED-ND rating system. He is a co-recipient of Environmental Protection Agency's Climate Protection Award for the Chula Vista Global Warming Reduction Plan, and CNU's Charter Award of Excellence for the SmartCode. He will return to China, where he is an advisor to the government on low carbon urban planning.

SUSAN ANDERSON

FACULTY

DIRECTOR, PORTLAND BUREAU OF PLANNING & SUSTAINABILITY

Susan Anderson leads the City of Portland's new Bureau of Planning and Sustainability (a merger of the Bureau of Planning and Office of Sustainable Development). She has worked with over 30 communities to promote resource efficiency, solar and other renewable resources, affordable housing, transportation options and industries that create green jobs. Susan frequently speaks at symposiums on land use planning and sustainable development, and building business/government partnerships. Prior to her work at the City, she worked at an environmental consulting firm, at the Oregon Department of Energy, as an environmental land-use planner and in public relations.

MICHAEL ARMSTRONG

FACILITATOR

POLICY, RESEARCH & INNOVATION MANAGER, PORTLAND BUREAU OF PLANNING & SUSTAINABILITY

Michael Armstrong focuses on policy and programs addressing climate change, energy efficiency, renewable energy, waste prevention and recycling, sustainable food systems and green building. He staffed Portland and Multnomah County's 2001 and 2009 climate change plans. Michael co-chairs the policy committee for the Urban Sustainability Directors Network and also serves on the network's planning committee.

NICK BARHAM

FACULTY

GLOBAL DIRECTOR, W+K TOMORROW, WIEDEN+KENNEDY

Nick Barham began his advertising career in London in the mid-1990s, working at BBH and then Karmarama, on brands like Levi's, IKEA and Amnesty International. After ten years he moved to Shanghai to join Wieden+Kennedy as Planning Director. In December 2010, Nick moved to Portland as global director of W+K Tomorrow. Working across the network to help W+K innovate beyond its core advertising business, he currently explores how emerging tech, sustainability, open data and a bunch of stuff he doesn't know about yet are changing how a communications company could behave and what it makes.

ERIN BARNES

FACULTY

CO-FOUNDER & EXECUTIVE DIRECTOR, IOBY

Before co-founding ioby in 2008, Erin Barnes was a freelance environmental writer and editor at Men's Journal. While completing her master of environmental management in water science, economics and policy at the Yale School of Forestry & Environmental Studies, Erin conducted field research on socio-economic values of water in Nicaragua and the Bolivian and Brazilian Amazon. She also worked as a community organizer at the Save Our Wild Salmon Coalition in Portland. Erin has lived in Brooklyn since 2008, and serves on the Board of the Manhattan Land Trust.

FACULTY+FACILITATOR SNAPSHOTS

ELLEN M. BASSETT, PH.D. — FACULTY

ASSOCIATE PROFESSOR OF URBAN STUDIES & PLANNING, PORTLAND STATE UNIVERSITY

Dr. Ellen M. Bassett's research interests revolve around land use and natural resources planning, property rights and environmental governance, and international development. Prior to joining the academy in 2001 at Michigan State University, she worked as an environmental planning advisor with IUCN in Uganda and as an urban planning advisor with a German aid project based in Nairobi, Kenya.

TRENT BERRY — FACULTY

PARTNER, COMPASS RESOURCE MANAGEMENT, LTD.

Trent Berry is a management consultant based in Vancouver, BC, focusing on technology evaluation, feasibility and market studies, policy development, ownership and financing and project implementation. With a background in economics, science and planning, his expertise spans energy, water and wastewater. Trent has led many feasibility studies for district energy systems in the Pacific Northwest, including the one serving Vancouver's Olympic Village. He was a fellow with the Portland Sustainability Institute, and has been an advisor to the BC Utilities Commission, assisting in reviews of over $15 billion in infrastructure projects, rate applications and resource plans.

LEW BOWERS — FACULTY

CENTRAL CITY DIVISION MANAGER, PORTLAND DEVELOPMENT COMMISSION (PDC)

Lew Bowers is responsible for translating Portland's comprehensive and central city plans into reality, which entails the planning and implementation of comprehensive central city revitalization projects. Highlights include renovation of the transit mall to include light rail and predevelopment work on the Oregon Sustainability Center, proposed as the first high-rise building to meet the net-zero energy "Living Building Challenge." Lew has more than 25 years experience in urban redevelopment, and worked previously for both the cities of Eugene, Oregon and New Haven, Connecticut.

CLARK BROCKMAN — FACULTY

DIRECTOR OF SUSTAINABILITY RESOURCES GROUP, SERA ARCHITECTS

Clark Brockman focuses on work with Living Buildings and EcoDistricts. He was the Cascadia Region Green Building Council chair, and is now a founding and current board member of the International Living Future Institute, co-chair of Portland's EcoDistricts Technical Advisory Committee and a steering committee member for the Portland Sustainability Institute. He speaks nationally on the impact of the built environment on climate change, serves as a green building policy advisor to cities, counties, the State of Oregon and members of its federal delegation.

JOE CORTRIGHT — FACULTY

CONSULTING ECONOMIST, IMPRESA

Joe Cortright specializes in helping businesses, organizations and communities to understand and to respond to the challenges of a knowledge economy. His firm serves as an advisor and analyst for state and local governments, private businesses, foundations and advocacy groups in more than a dozen states. He is recognized as one of the leading authorities on the Oregon economy, and has written numerous reports and studies on Oregon economic issues. He served as a principal consultant to the Oregon Business Plan and the Westside Economic Strategy, and currently serves as a member of the Governor's Council of Economic Advisors.

FACULTY+FACILITATOR SNAPSHOTS

TONY DEFALCO — FACULTY

CONSULTANT, TONY DEFALCO & ASSOCIATES

Tony DeFalco is an expert in community economic development, environmental protection and sustainability. He brings 15 years of experience working locally and nationally in environmental advocacy, coalition building and policy advocacy. His current projects include redevelopment of a landfill into a park in a low-income neighborhood in Portland, assisting a regional government in integrating equity into a regional infrastructure initiative and establishment of the first equity-driven EcoDistrict in the United States.

RALPH DINOLA, LEED AP BD+C, O+M — FACILITATOR

PRINCIPAL, GREEN BUILDING SERVICES

Ralph DiNola has over 20 years of green building expertise fusing sustainable development insight with engaging, performance-driven outcomes. He is a strategic thinker with the unique ability to apply and to assess ideas from concept through implementation, from an individual building to an entire portfolio or master planned development project. Portland projects include the LEED Platinum Mercy Corps Global Headquarters building, Mirabella Continuing Care Retirement Community and Nike flagship store. Farther afield, he directed sustainability consulting strategy on the 77-acre Msheireb Downtown urban redevelopment in Doha, Qatar.

BERT GREGORY, FAIA, LEED AP BD+C — FACULTY

CHAIRMAN & CEO, MITHUN

Bert Gregory leads Mithun to national recognition for concept-based, environmentally intelligent design. Under his leadership, Mithun has been recognized with numerous awards: four Committee on the Environment (COTE) Top 10 Green Projects, two American Society of Landscape Architects (ASLA) National Awards, the Sustainable Design Leadership Award from the American Institute of Architects (AIA) and an AIA National Honor Award for Urban Design. An expert in resource efficient design, Bert is as a national leader, speaker and advocate for sustainable building and urbanism.

SCOT HEIN — FACULTY/FACILITATOR

URBAN DESIGNER AND ARCHITECT, CITY OF VANCOUVER

Scot Hein manages the Urban Design Studio and has worked for the City of Vancouver for over 19 years. His work focuses on the planning and urban design of two large initiatives outside the downtown core: the Cambie Corridor and Mount Pleasant Neighborhood Center. Within downtown, he was responsible for the urban design and development of Woodward's, Southeast False Creek/Olympic Village, Mole Hill, Chinatown and the revitalization of Gastown/Victory Square/Hastings Corridor. Prior to his with the City, he was in private practice, specializing in research and development, health care, resorts and transit-related developments.

NICOLE ISLE — FACILITATOR

SENIOR SUSTAINABILITY ADVISOR, BRIGHTWORKS

Nicole Isle leads Brightworks' master planning and infrastructure-scale work from higher education and federal campuses to neighborhood developments both locally and internationally. Drawing on her expertise in watershed ecology, urban planning and sustainability tools and metrics, Nicole helps project teams realize a more comprehensive level of sustainability by focusing on ecological and social systems integration and team creativity, innovation and collaboration. She is a certified biologist at the Design Table through the Biomimicry Institute and is a member of the Portland Sustainability Institute's EcoDistricts steering committee.

FACULTY+FACILITATOR SNAPSHOTS

CHANI JOSEPH, MSC, LEED AP BD+C, ND — FACILITATOR

LEED SPECIALIST, CANADA GREEN BUILDING COUNCIL

Chani Joseph oversees the the Canada Green Building Council's community-scale programs. As part of this work, Chani has coordinated national technical advisory committees on topics such as smart growth, transportation and green infrastructure. With a background in urban planning, she is a member of the Planning Institute of British Columbia's South Coast Chapter Executive Committee, the British Columbia Healthy Built Environment Alliance and the Metro Vancouver Sustainable Transportation Coalition.

NICO LARCO, AIA — FACILITATOR

ASSOCIATE PROFESSOR OF ARCHITECTURE, UNIVERSITY OF OREGON

Nico Larco is a co-founder and associate director of the Sustainable Cities Initiative, a nationally and internationally awarded, multidisciplinary organization that focuses on sustainability issues as they relate to the built environment. Nico is a licensed architect with professional experience in the fields of architecture, urban design, planning and development. His research focuses on sustainable urbanism and the changing nature of urban and suburban form and development. Nico has a deep interest in applying his work towards making tangible change in the built environment and the policies that govern development and design decisions.

MOLLY MAYO — MASTER FACILITATOR

PARTNER, MERIDIAN INSTITUTE

Molly Mayo provides neutral, third-party facilitation and conflict resolution services to complex environmental and public health projects; designs and coordinates local and regional multi-party decision-making processes; facilitates community-based watershed groups; designs effective communications systems; and builds trusted relationships among polarized interest groups. Prior to joining Meridian, she served as an independent facilitation and mediation consultant, focusing on local and regional watershed groups. In addition, she worked as an associate at the Colorado Center for Environmental Management for four years.

BLAIR T. McCARRY, P.ENG., PE, ASHRAE, LEED AP — FACULTY

PRINCIPAL & SENIOR ENGINEER, PERKINS+WILL

Blair T. McCarry has extensive experience in engineering and energy systems at campus and district levels, including the district energy system for the renowned Dockside Green Development. He is a strong proponent of the 'whole-systems sustainability' premise and has led the systems planning for projects striving for LEED Platinum and beyond. Additionally he is an honorary member of the Architectural Institute of British Columbia (AIBC), a founding chair of the Vancouver Branch of the US Green Building Council's Cascadia Chapter and a member of the of the board and technical advisory group of the Canada Green Building Council.

TOM OSDOBA — FACULTY

PRINCIPAL, TAO STRATEGIES

Tom Osdoba has held leadership roles in two of North America's leading cities on sustainability. As sustainable economic development manager for Portland, he created a framework and business development strategies to build a sustainable regional economy. Key areas include clean, renewable energy, green building design and construction, and regional food production. He led efforts to launch the Portland Sustainability Institute and Clean Energy Works Oregon. As sustainability director for Vancouver, BC, he led initiatives for climate protection, green building and development, economic development strategy, and purchasing.

FACULTY+FACILITATOR SNAPSHOTS

TOM PUTTMAN, PE, AICP, LEED AP — FACULTY/FACILITATOR

PRESIDENT, PUTTMAN INFRASTRUCTURE

Tom Puttman has pushed to redefine infrastructure to create a more sustainable built environment by helping Portland plan and design some of its greenest developments (including EcoTrust, the Brewery Blocks and New Columbia), and by envisioning a sustainable future for Portland in studies like the Lloyd Crossing Sustainable Design and Development Strategy and Portland Community College's Net-Zero Campus Strategy. He has considerable experience in sustainable infrastructure planning and design, finance, regulation and management. Tom is a member of Portland's Watershed and the Portland Plan advisory commitees.

DAVE RAMSLIE, MSC, LEED AP — FACULTY/FACILITATOR

SENIOR SUSTAINABILITY PROGRAMS MANAGER, CITY OF VANCOUVER

Dave Ramslie is responsible for the City of Vancouver's climate change, green building, air quality and electric vehicles programs. He authored the City's 2020 carbon neutral buildings strategy, developed Vancouver's Home Energy Loan Program (Canada's first PACE program) and its solar city initiative and writing what is widely regarded as the "greenest building code" in North America. Dave has taught on sustainability internationally, and has won national awards from the Canadian Institute of Planners for Vancouver's EcoDensity Initiative, and from the Canada Green Building Council for Government Leadership in Green Building.

GREG SEARLE — FACULTY

EXECUTIVE DIRECTOR, BIOREGIONAL NORTH AMERICA

Greg Searle is a sustainable community facilitator and sustainable lifestyle coach. For 18 years, BioRegional has delivered inspiring, award-winning sustainability projects, from the BedZED ecovillage (where Greg lived) to the 'sustainable lifestyle' reality TV series that Greg helped the Discovery Channel produce for three seasons. Greg manages the ecoConcierge and Design for Sustainable Behaviors programs which make healthy, low-carbon lifestyles more convenient in existing buildings. Greg also facilitates 10-year sustainability action plans for One Planet Communities—some of the most ambitious green master-planned communities, campuses and EcoDistricts.

TIM SMITH — FACILITATOR

PRINCIPAL & DIRECTOR OF URBAN DESIGN AND PLANNING, SERA ARCHITECTS

Tim Smith's work in sustainability has received a number of awards including a Progressive Architecture Research Award for Sustainable Communities in the Urban-Rural Interface. He was instrumental in developing the EcoDistrict concept for the City of Portland, a concept he is applying to a number of master planning projects. He has directed SERA's efforts to develop the Civic Ecology community sustainability framework, a topic on which he has lectured and written.

JOE STAPLES — FACULTY

CREATIVE DIRECTOR, WIEDEN+KENNEDY

Joe is a creative director, copywriter and teacher at Wieden + Kennedy and WK12. Most recently, Joe worked on the Chrysler campaign responsible for the 'Halftime in America' commercial for Super Bowl XLVI. Joe's past work through print, TV, exhibition and online work has included campaigns for Dodge, Heineken, Nike, Nike Livestrong and Jeep.

FACULTY, FACILITATOR+STAFF SNAPSHOTS

DENNIS WILDE

FACULTY/FACILITATOR

CHIEF SUSTAINABILITY OFFICER, GERDING EDLEN

At Gerding Edlen, Dennis Wilde helped to launch Gerding Edlen Sustainable Solutions (GESS), a separate business entity committed to engaging strategies where building projects generate more energy than they consume and consume more waste than they produce. GESS is working on several district scale distributed energy and waste management systems. Dennis is also chair of the Oregon Built Environment & Sustainable Technologies Center, one of Oregon's Signature Research Centers.

TYLER WHISNAND

FACULTY

CREATIVE DIRECTOR, WIEDEN + KENNEDY

Tyler Whisnand is tasked with developing comprehensive communication ideas for Levi Strauss & Company, a campaign for which he has been part of for the past three years. Tyler has also been a creative director on the Nike account, including campaigns for Nike Livestrong, Nike Basketball, SPARQ Training and the Nike Foundation's The Girl Effect. He served as a director of Wieden+Kennedy 12, the experimental communications school at Wieden+Kennedy. Previously, Tyler was a partner and creative director at KesselsKramer in Amsterdam, the Netherlands where he developed the marketing campaign and slogan: Iamsterdam. He has contributed to and been an editor and writer for COLORS Magazine.

ROB BENNETT

FACULTY/STAFF

EXECUTIVE DIRECTOR, PORTLAND SUSTAINABILITY INSTITUTE

Rob Bennett has lead the Portland Sustainability Institute for the last three years. He comes most recently from the Clinton Climate Initiative, where he was the residential and cities policy manager, developing residential pilot programs for the cities of Houston and Chicago. For over eight years prior, he worked for the cities of Vancouver, BC and Portland. He led the development of Vancouver's Green Building Strategy and facilitated the green building and infrastructure activities for the Southeast False Creek redevelopment (the 2010 Olympic Village). In Portland, Rob founded the City's Green Building Program, G/Rated, led conservation program and policy development in the areas of energy efficiency and corporate sustainability.

NAOMI COLE, LEED AP

FACULTY/STAFF

PROGRAM DIRECTOR, PORTLAND SUSTAINABILITY INSTITUTE

Naomi Cole leads the EcoDistricts program, focusing on strategy and concept development, creation of tools and resources, piloting the approach in five pilots and the EcoDistricts Summit. With an interdisciplinary background in architecture, environmental science and urban studies, she has worked in the private sector as a consultant for Konstrukt and as a sustainability coordinator at ZGF Architects. Naomi is a member of the City Club Board of Governors and recently joined the AIA Urban Design Panel. A native Portlander, she started working in local architecture firms at age 14.

TEAGUE DOUGLAS

STAFF

EDUCATION COORDINATOR, PORTLAND SUSTAINABILITY INSTITUTE

Teague Douglas manages Portland Sustainability Institute's education and training programs, which include the EcoDistricts Summit, the EcoDistricts Institute and various webinars and workshops. She comes most recently from the design/build industry where she worked in multiple areas of the field. In the Portland region, she was a project manager on small commercial build outs, interned as an architect on residential design and remodeled countless homes as a carpenter. Originally from the east coast, Teague moved to Portland from Vermont where she studied architecture at Middlebury College and worked as a carpenter for a historic restoration construction company.

CASE STUDIES

NEIGHBORHOOD

PROJECT

Augustenborg, Sweden

In 1998, the Augustenborg district in Malmö, Sweden, initiated a renovation process through an urban renewal program at the community and household scales. They focused at the household level on improving energy efficiency, creating green roofs, and improving access to recycling facilities. At the community level, they offered sustainable transportation alternatives (pedestrian and bicycling infrastructure, alternative fuels car-pooling and a light transit system); created new green open spaces increased economic opportunities tied to the community members through investments from the local business community; promoted maintenance of the neighborhood and public participation; and reduced neighbors' emigration rates.

STRATEGIC PARTNERS

MKB Housing Company, local businesses associations, NGOs, the European Union and the local government.

FINANCING

The project was funded by the MKB Housing Company (around £9.7 million), the Malmö local government (around £6.8 million), a local investment program initiative (around £2.3 million) and EU funding (around £600,000).

BARRIERS TO IMPLEMENTATION

ORGANIZATIONAL

The dynamics between individuals in the organizational structure was the major barrier to the implementation of the Augustenborg Eco-District Renewal project. Though residential involvement was necessary, it led to community discourse issues; louder individuals made their voices heard, whereas quieter individuals were often overlooked. Furthermore, serious concerns arose when the local housing company changed executive directors, who re-organized the company by replacing the project officer with a new one lacking the in-depth understanding of the project that his predecessor possessed. The housing company organization was not strong enough to withstand the will of the new executive director and the project lost legitimacy lower in the company's hierarchy, leading to a project only anchored in the upper management. This resulted in the Augustenborg EcoDistrict Renewal project developing at a slower pace, losing legitimacy among its residents.

LESSONS LEARNED

CAPACITY

Often neighborhoods may lack the organizational skills to start this type of program or they may not have the required expertise or knowledge to envision, plan and conduct a sustainable renovation process of this magnitude. Neighborhood residents may lack the needed time to commit to these projects. Even when successful projects are implemented they are difficult to maintain over time.

EQUITY

Often low-income neighborhoods may lack access to governmental resources or may be suspicious about governmental investments since these might increase taxes, rents and lead to gentrification and, eventually, to involuntary displacement.

COMMUNITY ENGAGEMENT

The engagement of the district's 3,000 residents has resulted in increased pride in their part of town and a decline in graffiti and vandalism. Emigration from the district has been reduced by 20% with empty properties now being unusual within the district. Community engagement has resulted in an increase in local

election participation from 54% in 1998 to 79% in 2002.

ECONOMIC DEVELOPMENT

Residents have initiated several local enterprises and the unemployment rate has dropped by 15%. Through civic participation and community cooperation, it may be possible to increase prices of homes in the district and neighborhood quality of life.

GREEN ROOFS

The neighborhood project was able to create a 9,500-m^2 publicly accessible Research Centre Botanical Roof Garden. Through this "demonstration project" it is possible to promote the use of green roofs among neighborhood residents.

STORM-WATER MANAGEMENT

A water collection system collects 90% of the storm-water from roofs, roads and parking lots, as well as rainfall in natural trenches, ditches, pods, wetlands and reservoirs before having it flow into a conventional sewer system. Through projects like this it is possible to: 1) reduced the rainwater run-off; 2) stop flooding in the area; 3) improve the neighborhood environment and aesthetics through courtyard areas that also may be used for recreational purposes.

MOBILITY

It is possible to design and implement sustainable transportation programs at the neighborhood scale to improve air quality and school safety and to reduce congestion. Augustenborg organized a carpool system with electric vehicles and cars fueled by ethanol and biogas, promoted bicycling transportation and implemented two electric trains that transported 300,000 passengers in two years of service.

WASTE MANAGEMENT

Almost 70 percent of all waste is now recycled and they expect that 90 percent will be collected, recycled and re-used in the next months. They are using food waste to make fertile compost and biogas.

ENERGY EFFICIENCY

Energy efficiency improved by 20 percent as compared to 1995 (heating, hot water and electricity use). A solar energy project with 450 m^2 solar panels, connected to the heating system, and a few photovoltaic systems in the industrial area provide a majority of the district's energy. In spring 2009, a wind power plant was installed at the local school. As a result heat and water consumption has decreased by 25 percent and Augustenborg neighbors' carbon footprint has diminished by 20 percent.

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NEIGHBORHOOD CASE STUDY

Hammarby Sjöstad, Sweden

The Hammarby Sjöstad area was originally intended to be an olympic village for Stockholm application to the 2004 summer Olympics, Hammarby Sjöstad is now instead the result of a long process of converting a brownfield area into a sustainable waterfront residential neighbourhood. The was previously dominated by small scale industries in a shanty town area with temporary corrugated iron buildings. This was the case up until 1998 when the implementation of Hammarby Sjöstad started. The soil was heavily polluted from previous use and had to be cleaned before any construction could start. Today 25,000 people are living in the 11,000 apartments in Hammarby Sjöstad. The final build out is scheduled for 2017 and will then house roughly 26,000 people. The sustainability profile of Hammarby Sjöstad has a strong focus on environmentally sensitive solutions.

Sustainable public transportation is offered with electric trains, biogas powered buses and commuter boats. Biking, walking and car-pooling are also supported means. Residents are offered recycling stations and food waste collection for biogas production. All apartments are connected to the district heating system and the household waste supplies fuel for the district heating plant. In 900 of the apartments biogas stoves have been installed. Some apartments also have solar hot water. The sewage from all apartments is cleaned and used to produce biogas used locally.

STRATEGIC PARTNERS

Local government, local public transportation agency, private developers and consultants, national transportation agency and Stockholm business region

FINANCING

The project was funded through local government (around $700 million, including local investment programs) and private investments (around $4.4 billion).

BARRIERS TO IMPLEMENTATION

FINANCIAL

In the beginning, private developers were hesitant to modify their standard procedures in order to meet the project's environmental requirements, due to higher cost. A small, but important grant in the form of a local investment program from the Swedish Environmental Protection Agency made it possible for developers to meet the environmental goals.

LIFESTYLE

Since Hammarby Sjöstad was a new residential area, it wasn't residential groups that pushed for sustainable development, but rather the city itself. One of the biggest barriers was how to get prospective residents to comply with the planners' environmental goals and the related behavioral changes. A local information center serving the community has been one way to communicate the ideas of sustainable living.

SOCIAL

Since the area was formerly occupied by people on the outskirts of society, some criticism arose regarding displacing socially vulnerable groups.

LESSONS LEARNED

Hammarby Sjöstad is now an upper-middle-class, family-oriented neighborhood dominated by residents in their 30s to 40s with young children. Around two-thirds of the apartments are privately owned, and around one-third are rental apartments.

INTEGRATED PLANNING

Integrating the environmental program into the planning process and ensuring the inclusion of all stakeholders was a key component in getting technical solutions in place. The planning process also provided new platforms for discussing local environmental goals.

INTEGRATION

Using a systems perspective helped Hammarby Sjöstad achieve its environmental goals by linking district heating, sewage treatment, biogas production, and waste management into an integrated system. (It should be noted that this approach is used by most of the neighborhoods in the Stockholm metropolitan area).

LACK OF MONITORING OR FOLLOW-UP

There has been no systematic gathering of data to measure the results of the environmental program. It is neither stated how the environmental goals for the project should be evaluated, nor who is responsible for monitoring each goal. The background and motivation behind the environmental goals was also lacking. The City of Stockholm's intentions were also unclear, since agreements with private contractors and developers did not state that those parties had to comply with the environmental goals.

ENVIRONMENTAL GOALS ADAPTED TOO LATE

The environmental focus for the area came late in the planning process, leading to conflicts over some of the goals identified for the project. The implementation of the project was also complicated by those goals. This issue could have been avoided if the environmental focus for area had been applied in an earlier stage of the planning process.

MOBILITY

With a goal that 80 percent of the travel by people living and working in the area should be done by public transportation, bike, or walking, investments in a high-capacity public transportation system consisting of trams, biogas-fueled buses, and boat buses have been critical.

PARKING LOTS

Hammarby Sjöstad was initially designed to have very few parking lots, but opinions from prospective residents forced planners to increase the number of parking lots. This has caused the area to become more auto-dominated than initially planned.

INFORMATION CENTER

The information center "GlashusEtt" offers education about the project and hosts national and international groups interested in sustainability. The center is considered as an important part of the project since it promotes Swedish sustainability solutions internationally.

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Stockholm Royal Seaport

Formerly a brownfield site, the Stockholm Royal Seaport is designed to be a world-class waterfront urban district with a strong focus on sustainability. When completed in 2030, it will provide 10,000 apartments and 30,000 workspaces. Construction started in 2010, and the first apartments will be occupied in 2012. The Stockholm Royal Seaport aims to be a diverse neighborhood combining offices and climate-adapted housing with a green inner-city character. Its environmental targets are ambitious. For example, carbon dioxide emissions are expected to be below 1.5 tonnes per person by 2020 (as to compared to the Stockholm average of 3.4 tonnes per person in 2009, and the City's general target of 3 tonnes per person in 2015). By 2030, the target is for Stockholm Royal Seaport residents to be fossil fuel-free. All neighborhood development will also be adapted according to the prognosis for future sea-level rise.

To meet environmental targets, the neighborhood will provide public transport in the form of subway, biogas-powered buses, tram, and boat buses. It includes a closed-loop integrated waste management system and LEED-certified buildings. The area is prepared for a future smart grid electrical system. The Stockholm Royal Seaport also represents an investment to market Swedish solutions for sustainable development.

STRATEGIC PARTNERS

Local government, private business (energy producers, cruise ship operators, banks, clean-tech companies), the Port of Stockholm.

FINANCING

The City of Stockholm is investing around $150 million in the project. The biggest costs for the city are cleaning polluted soil, compensation and evacuation of affected stakeholders in the area, as well as groundwork and infrastructure. Any land to be build up was to be owned by City of Stockholm; desirable lots were then

sold to private developers on the condition that development complies with the environmental targets.

Given the quality of the land, no further financing incentives were needed to attract private developer interest. The developers cover their costs by selling the apartments at high prices.

A pilot smart grid system is being installed under a new model of collaboration between the private sector, academia, and local government. This joint venture was additionally sponsored by the Swedish Energy Agency and the Swedish Governmental Agency for Innovation Systems.

BARRIERS TO IMPLEMENTATION

SOCIAL

In order to finance the project, the City of Stockholm sold the land to private developers at a very high price. Developers are now selling apartments at a high price, limiting lower-income residents from investing in the area and reducing diversity of income.

CONFLICTING TARGETS

Cruise ship traffic is very important economically to Stockholm, creating around 4,000 full-time jobs. However, cruise ship traffic isn't very environmentally sustainable, contributing to greenhouse gas emissions and eutrophication of the Baltic Sea, and threatening marine life.

LESSONS LEARNED

Stockholm Royal Seaport is a neighborhood-in-progress, so lessons learned are based on planning and design rather than actual performance. But with implementation underway, there are several key lessons from the planning process.

Competence program for private developers
A lesson learned from Hammarby Sjöstad was that the environmental program must come in at an early stage in order to make the implementation phase easier. This is done through a competence program, where city planners, architects, and private developers exchange knowledge so that all actors can plan their work according to the environmental targets set for the project. This competence program is, for the City of Stockholm, celebrated and considered to be a real success story in the planning process.

WORKING WITH SUSTAINABILITY IN A NEW NEIGHBORHOOD

Real estate agents selling the apartments must be very clear that the area is designated a sustainable district. Planners from the city have worked to ensure that information about what this entails is provided to real estate agents.

Since Stockholm Royal Seaport is not a community-driven project, but a project initiated by the city itself, communication of the sustainability profile to prospective residents is essential. A housing manual for the new apartments with information on how to live more sustainably. It is still too early to tell if their educational efforts will have the desired effect.

SYSTEMS APPROACH TO MEET ENVIRONMENTAL TARGETS

The Hammarby Sjöstad model has been applied to this project,

meaning that district heating, sewage treatment, biogas production, and waste management are being linked into an integrated system, contributing to closing the loop on resources.

MOBILITY

In order to achieve the environmental targets for this project, a fully functioning transport infrastructure must be in place when the first residents move in. The infrastructure is achieved in several steps. One line of the Stockholm metro system already serves the area, and walking lanes to the existing metro have been improved. At a later stage, biogas-fueled buses will complement the metro service, and the existing tram network will be extended out to the newly built area.

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PROJECT CASE STUDY

Engagement Technologies

A number of emerging community engagement programs use technology to inspire environmental action, provide knowledge and support local organizations by providing them with tools and resources to finance and connect with communities. This technological strategy uses online forums, web services and social media to connect groups working on environmental and community enhancement projects to interested volunteers and donors. Investors use online micro-philanthropy to fund the project they care about. People with project ideas can post it on the online forum. The organization distributes these funds to projects fully funded by donors. Technology and new civic media such as smart phone apps provide a forum for local community and environmental groups (who support projects like community gardens or "friends of" parks) to petition individuals directly for support.

BENEFITS

PERFORMANCE

- Project ideas posted in and completely funded by online community engagement programs help
- Increases quality of life in communities by reducing greenhouse gas emissions, increasing acres of open space, and removing pollutants from the air, water and land
- Increases productivity by avoiding face-to-face petitioning and by providing information access to billions of Internet users
- Increases the number of new collaborative projects, cross-community exchanges, and replicated projects

EQUITY AND COMMUNITY

- Support accessible action in communities with a larger share of environmental problems and fewer resources to confront them
- Collects funds directly through online micro-philanthropy from interested donors in the community and throughout the world to decentralized, community-based environmental projects
- Lets donors know exactly when, where, and how their gifts will be used, because they are contributing to a project rather than to a large organization
- Encourages people to understand and value their local environment, and inspire direct engagement and volunteering within their communities

ECONOMIC

- Enables project groups to communicate faster and directly with donors, including international donors
- Saves petitioning costs for project groups, as their petitions are always accessible online
- Makes resources and volunteers easier to find and less costly

BARRIERS TO IMPLEMENTATION

INSTITUTIONAL

Residents in lower-income neighborhoods may have difficulty accessing the web. Because organizations like ioby use social

media as a catalyst for environmental engagement, Internet access is crucial to engaging in these programs.

COMMUNITY

Community outreach programs are critical in garnering support for projects. ioby relied on brainstorming sessions with some of its best donors, committed volunteers and successful project leaders to share what ioby meant to them at a personal level and why they felt connected to their work. These sessions encouraged community involvement.

LANGUAGE

Since community engagement is essential to the success to this strategy, language barriers could potentially hinder its spread in certain communities.

FINANCIAL

Community engagement programs need initial funding to help them set up projects (ioby started out as a fiscally sponsored group by the Open Space Institute) and build their social media interaction with donors and the community. For example, FuseIQ helped ioby build and design a stellar website on a shoestring budget that met the needs of projects and donors.

CASE STUDY IN OUR BACKYARD

In our backyard (ioby) is a pioneering program founded in July 2008. A nonprofit organization based in Brooklyn, New York, ioby connects New Yorkers to environmental projects in their own neighborhoods by promoting donation and volunteer opportunities through its crowd-resourcing website, *ioby.org*.

Over the past two years, 73 community-improvement projects have been funded through ioby, with a 73 percent success rate for projects achieving their funding goals. Projects budget on an average total of $845, with an average donation of $35. There have been four new urban farms, at least 14 beach or river cleanups, and over 20 recycling programs. In 2011, 50 projects funded through ioby took place on an aggregate 1,080 acres in New York City, an area 20 percent larger than Central Park.

One successful project is The Green Map System, which raised $452 on ioby to help fund several events over the summer. These creative, hands-on events encouraged participants to create maps that easily identified green spots in their neighborhoods. Another example is Compost for Brooklyn, where residents donated $2,030 for materials to build new composts bins, a lumber shed and a rainwater harvesting system on Newkirk Avenue and East 8th Street, drop-off locations for scrap composting.

STRATEGIC PARTNERS

ioby recently announced a partnership with Deutsche Bank Americas Foundation, which will match donations made to ioby for all projects led by Community Development Corporations in New York City.

FINANCING

ioby.org is an online micro-philanthropic initiative that connects groups working on environmental projects to people who care about their neighborhoods. People with project ideas can post them on ioby.org, where interested individuals can invest in the projects. Funding can come from a single person or a group of people who care about the issue. ioby distributes funds to a project only after it is fully funded. Unfunded projects expire after seven months.

IMPLEMENTATION

ioby lists 5 steps for volunteers and donors on how to get involved:

1 Pick a project.
2 Nurture it.
3 Follow the results.
4 Get your hands dirty and inspire others.
5 Prepare for great things.

People interested in posting new projects fill out an online application, then ioby connects the project to a community of New Yorkers. Projects are posted on the site, so that people can choose which project they want to volunteer for or help to fund. ioby offers an opportunity for donors to walk down the street and actually see the results of their contribution. Projects have project profile pages where people can post photos and videos and write about the progress of their projects. ioby encourages the building of long-lasting community partnerships among volunteers and donors.

OTHER PROJECTS

- **NEW YORK, NY** Change by Us
- **NEW YORK, NY** Open Plans
- **PHILADELPHIA, PA** Change by Us

LESSONS LEARNED

- People are more willing to donate resources to organizations that deserve their trust. ioby stands for a smartly managed group with transparent financials, efficient spending, and a track record of on-the-ground success. Community engagement takes a more transparent form if information about a project's progress and the people involved are published online.
- The web interface for communication needs to be capable of supporting eCommerce, collaborative social community solutions, and a high volume of visitors. For instance, ioby worked with New Signature to develop the new site, with Drupal 7 as its platform. The website serves as both an online bulletin board and shopping cart. Some examples of other organizations who rely on their websites for donations are donorschoose.org which supports school teachers and kiva.org, a slightly different model because it uses micro-loans that are paid back to the donor (unlike micro-grants, which are not) to support micro-enterprises in developing countries.
- To be successful, ioby learned that it had to combine crowd-sourcing and crowd-funding, since the need for local volunteers is as necessary as the need for financial support.

REFERENCES

In Our Backyard: *https://ioby.org*

Change by Us NYC: *http://nyc.changeby.us/#start*
Change by Us Philadelphia: *http://philly.changeby.us/*

Open Plans (NY): *http://openplans.org/*

PROJECT CASE STUDY

Active Living

According to the Active Living Research program from the Robert Wood Johnson Foundation, active living integrates physical activity into the daily routines of people. Its goal is for youth to accumulate at least 60 minutes of physical activity each day, and for adults to get at least 30 minutes through: walking or bicycling for transportation, exercise or pleasure; playing in the park; working in the yard; or using recreation facilities.

In order to facilitate and support opportunities for active living, a focus on the built environment and good urban design—including neighborhoods, transportation systems, buildings, street and sidewalk design, parks and open space—is essential.

BENEFITS

PERFORMANCE

- Encourages population density and employment through urban design
- Stimulates mixed land-use development
- Encourages accessibility to transit and traffic safety through active living policy

EQUITY AND COMMUNITY

- Encourages activity of neighborhood residents with public areas and exercise programs
- Increases social capital, sense of community and perception of safety
- Provides individual savings by offering alternative modes of transportation

ECONOMIC

- Expands housing choices (compact, mixed-use neighborhoods can provide smaller, more efficient homes and multi-family developments, reducing overall infrastructure and housing costs)
- Promotes healthy economies

BARRIERS TO IMPLEMENTATION

INSTITUTIONAL

Local zoning regulations (particularly in suburbs) may restrict density and mixed land use, thereby preventing compact development. Highly regulated land-use markets limit the supply of compact developments. Lack of coordination between health, land-use, and transportation policies makes implementing compact, mixed-use developments difficult.

FINANCIAL

Private developers often lack incentives to develop affordable multi-family projects, due to lower profits. Residents of low-income communities have limited resources to develop the built environment infrastructure necessary to encourage healthy behaviors such as pedestrian infrastructure and places where they can be physically active: sports facilities, parks, bike paths and lanes, walking trails, and public pools.

POLITICAL

Local governments often do not support compact developments due to political resistance from homeowners worried about congestion, local taxes, or home values. Often city programs are single policy driven, making both holistic design and agency

OTHER EXAMPLES

- **KANSAS CITY, MO** Perceptions of Neighborhood Park Quality: Associations with Physical Activity and BMI
- **NATIONWIDE (49 COMMUNITIES)** Healthy Kids, Healthy Communities
- **PORTLAND, OR** Understanding Barriers to Bicycling in Low-Income Communities of Color

coordination (housing, land use, health, and transportation) complicated. Walking and bicycling often are not considered municipal priorities, face lack of funding and staffing challenges, and are not sufficiently supported by residents. These barriers are more prevalent among rural municipalities.

PERSONAL

People are less willing to walk in their neighborhoods when they have to deal with stresses (traffic congestion, noise, violence, injuries, falls and traffic accidents). Lack of time and energy, poor health and childcare responsibilities discourage physical activity.

SOCIAL

Not having company, not seeing other people exercising, lack of interest, self-consciousness about one's appearance, and cost of structured physical activity programs prevent people from being physically active. Low-income communities often lack market-control policies such as rent control or inclusionary zoning, which may help to reduce potential involuntary displacement due to neighborhood redevelopment projects.

URBAN

Highways may be difficult to cross by foot due to infrequent pedestrian crossings. Turn lanes that affect bus access to a bus stop reduce willingness to use public transit. Lack of sidewalks also prevents physical activity.

CASE STUDY SAFE ROUTES TO SCHOOL

Starting in 1997, this Congress-funded program has set to make walking or bicycling to and from school safer for children through education and infrastructure improvements. In addition, schools and local governments look for ways to reduce the number of children who are driven to school, reducing traffic congestion and air pollution, and getting children to be more physically active. In 2011, the program benefited 11,100 schools and 4.8 million children.

STRATEGIC PARTNERS

Federal government, state departments of transportation, local governments, school systems, parents, local school boards, state and local departments of education, and health agencies and organizations.

FINANCING

Almost $950 million has been allocated from the federal government to state transportation departments between 2005 and 2011. Current funding is $183 million per year. State departments of transportation also contribute to the funding of the program.

IMPLEMENTATION

State departments of transportation award federal funds to local governments and school systems to improve safety and get more children walking and bicycling to school. Between 70 and 90 percent of funding is spent on infrastructure improvements (sidewalks, bike paths, crosswalks, school zone signage, and traffic calming) within a two-mile radius of schools. The remaining 10 to 30 percent is allocated for programs such as teaching children traffic safety skills, ensuring that motorists are driving safely around schools, and running programs that encourage more children to walk and bicycle. Because this program considers broader goals connected to health, education, and social justice issues, it has been necessary to go beyond traditional transportation partners to engage a range of organizations and agencies.

LESSONS LEARNED

- Neighborhoods that offer programs to encourage physical activity in public parks increase residents' active living.
- Improvements can include enhancing street aesthetics by widening and maintaining sidewalks; promoting street connectivity and short blocks; having trees, benches, waste receptacles and good lighting on sidewalks and having maximum parking requirements.
- In suburban areas, older strip malls can be rebuilt as mixed-use projects (retail, office and residential together) to retain and attract work, shopping and leisure activities and to encourage walking.
- Conflict points need to be controlled through road design elements: medians, alleys, traffic signals, movement restrictions, intersection design, turn/merge lane, free-flow, corner radio, and bicycle infrastructure.
- Traffic-calming measures such as speed limits, narrow car-lanes and streets, speed bumps, altered road alignments, and traffic circles discourage automobile traffic.
- Adopting ordinances that increase street connectivity spreads vehicle traffic throughout the network, providing smaller and safer roads for pedestrians and bicyclists.
- Promoting higher-density land use and increasing the number of destinations—places to work, shop, and recreate—in walking or bicycling distance reduces the distances traveled by motor vehicle and increases walking rates.

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CASE STUDY

Transportation Demand Management

Transportation demand management (TDM) refers to various strategies that change travel behavior (how, when, and where people travel) in order to increase the efficiency of transport and parking systems and achieve planning objectives. Many factors affect people's transport decisions, including the relative convenience and safety of travel modes, cost, and land use. TDM strategies attempt to influence these factors to encourage more-efficient travel patterns, such as shifts from peak to off-peak periods, from automobile to more energy- or parking-efficient modes, and from dispersed to closer destinations. These strategies include: improving available transport options; using pricing or offering other incentives to change travel mode, time or destination; improving land-use accessibility; and reforming transportation policy.

BENEFITS

ENVIRONMENT

- Reduces parking demand
- Reduces traffic congestion, delays and associated costs
- Prevents air, noise, and water pollution; reduces wildlife crashes and other types of environmental damages
- Supports strategic land-use planning objectives, such as reduced sprawl, urban redevelopment, and reduced habitat fragmentation

EQUITY AND COMMUNITY

- Enhances travel options, particularly for nondrivers
- Improves local environmental quality and community cohesion
- Encourages better public fitness and health due to more physical activity, usually by increased walking and cycling

ECONOMIC

- Reduces road and parking facility costs
- Helps consumers save money by reducing their need to own and operate motor vehicles
- Allows for increased density, higher property values and increased tax base by reducing traffic and parking demand
- Supports a community's economic objectives, such as increased productivity, employment, wealth, property values and tax revenues

BARRIERS TO IMPLEMENTATION

INSTITUTIONAL

The most common institutional barrier is just the fact that existing planning and funding practices are oriented to favor capacity expansion over demand management, even when demand management is more cost-effective and beneficial overall. There is also general institutional objection to change.

FINANCIAL

Financial barriers are that local government funding processes are often hard to change for a new approach such as transportation demand management. Also, with strategies that need financial support from local businesses, there is often initial resistance as the benefits are not clearly understood.

POLITICAL

The biggest political barrier is a general resistance to change or the unknown. In addition, special interests that benefit from the current system are going to make their concerns known to their elected officials and staff. Some anti-government groups oppose TDM programs on the grounds that they represent government intrusion into private activities. Many state and local transportation departments are dominated by engineers who are

accustomed to building capacity, not reducing demand.

CASE STUDY LLOYD TMA

The City of Portland implemented a Lloyd District Partnership Plan in 1997 to address parking, congestion problems, and single-occupant vehicle use to and from the district. Among the programs implemented by the Transportation Management Association (TMA) are: transit, bicycling, car sharing, walking and ridesharing. The TMA has also implemented parking pricing in the form of meters (whereas on-street parking had been free), discounted transit passes, and other transportation demand management strategies.

STRATEGIC PARTNERS

City of Portland, regional transit providers C-TRAN and TriMet, and the Lloyd District Transportation Management Association (TMA) which includes businesses and organizations located within the Lloyd District.

FINANCING

The Lloyd TMA receives funding from the Lloyd Business Improvement District, through Metro regional transportation funding, and through parking revenue in the district.

IMPLEMENTATION

Among the effects of the TMA programs (transit, car sharing, bicycling, walking, vanpooling, parking pricing, and discounted transit passes) are a decrease in SOV rates and an increase in walking and bicycling trips. In 1997, 76 percent of all employee commute trips to the Lloyd District were made in an automobile, of which 60 percent were drive-alone trips and 16 percent were carpool. Today, the SOV percentage has dropped to 40 percent. Since 2009, the percentage of drive-alone trips has decreased from the previous year in 10 of the last 11 years. In 2009, TMA programs resulted in a reduction of 4.3 million peak-hour vehicle miles traveled.

LESSONS LEARNED

- Focus planning efforts on 'least cost planning' as it will naturally point to demand management before capacity.
- Begin with a comprehensive, long-term, strategic vision of the overall outcomes you want to achieve.
- Involve users in TDM planning to ensure that their ideas and concerns are considered.
- Offer a wide range of transport options and incentives so that people can choose the changes that best meet their needs.
- Make changes predictable and gradual.
- Use financial incentives including tolling and paid parking. It is virtually impossible to have a significant effect on vehicle travel without them.
- Encourage zoning and development practices that favor higher-density, mixed-use infill and more pedestrian- and transit-friendly communities.
- Develop cooperative organizations involving transportation agencies, local governments, businesses, and nonprofit organizations to support TDM efforts.
- Parking pricing is considered a primary factor affecting transportation mode choice.

OTHER EXAMPLES

- **SAN FRANCISCO, CA** The San Francisco Metropolitan Transportation Authority established SFpark to use new technologies and policies to improve parking and reduce traffic by helping drivers find parking. Parking availability is more transparent, making streets less congested and safer.
- **ALAMEDA, CA** The Congestion Management Program enlisted four employers to provide financial incentives to encourage reduced driving.
- **NEW YORK, NY** The New York Sustainable Streets Program implemented policies and programs to reduce total vehicle traffic and encourage use of efficient modes.
- **LUND, SWEDEN** The city implemented mobility management programs that improve transport options (walking, cycling and public transit), and encourage use of efficient modes. As a result, despite population growth, automobile traffic has stayed steady, while use of alternative modes increased significantly between 1995 and 2004.

- Eliminating parking subsidies may mitigate the need for congestion pricing.
- Increasing the frequency of public transit may decrease single-occupant vehicle (SOV) use.

REFERENCES

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PROJECT CASE STUDY

Bike-sharing

A bike-sharing system is a public active transportation program composed of interconnected stations that exchange bicycles for free (first 30 minutes) or at an affordable rate for short-distance trips in urban areas.

These programs have been developed as an alternative to motorized transportation to prevent its negative externalities, and also as a response to the increasing need for urban sustainable development. It presents a way to resolve health problems associated with sedentary lifestyles, such as obesity.

BENEFITS

ENVIRONMENT

- Reduces travel by car, public transportation and private bikes
- Improves air quality and climate
- Reduces vehicle emissions, congestion, and fuel use

EQUITY AND COMMUNITY

- Contributes to neighborhood economy
- Increases access to jobs, services (health/education), healthy groceries, and recreational/social activities
- Increases social capital, sense of community and quality of life
- Improves health of community members by encouraging walking and biking
- Provides flexible mobility options and supports multimodal transportation
- Cuts transportation costs for community members
- Bike-share is a public transit program that is part of an intermodal transportation system, with potential benefits for those with few mobility alternatives.
- Because accessibility of bicycles is important for the program to succeed, stations located in low-income neighborhoods with information and traffic-safety conditions in languages other than English will increase participation.

BARRIERS TO IMPLEMENTATION

INSTITUTIONAL

A common barrier preventing all residents from bicycling is lack of space to store a bicycle; bike-share programs might overcome this barrier.

Cities might not have the capacity to design and implement a bike-share program. Conditions of the built environment might limit the number of locations for bike stations, where bicycles can be rented or returned. Conflicts might arise between city

OTHER PROGRAMS

- **MULTIPLE U.S. LOCATIONS** B-cycle
- **MULTIPLE U.S. LOCATIONS** Alta Bicycle Share
- **TORONTO, ON** BIXI

and state governments regarding legal authority over streets and transportation management.

FINANCIAL

Most of these programs are expensive to operate and do not provide a self-funding mechanism. These programs are often funded by local governments, charitable sources, nonprofit private organizations, private sponsors, or public-private partnerships. Transnational advertising companies such as Clear Channel and JCDecaux have funded and administer many of these programs. Sometimes these companies charge cities for the service (as in Mexico City) or run them in exchange for governments' permission/concession for outdoor commercial advertising.

POLITICAL

Programs funded by advertising companies might generate political conflicts due to allowed concessions/permissions or because advertising could be viewed as a source of visual pollution and invasion of the public space. Since cities often rely on their own economic resources to operate these programs, potential political conflicts could result from allocating financial resources for a bike-share program.

CASE STUDY THE VÉLO'V PROGRAM

This Lyon, France-based program started in 2005. It comprises 4,000 bicycles that can be accessed at and returned to any of 340 stations, most no further than 1/3 mile from downtown Lyon.

STRATEGIC PARTNERS

Advertising companies, NGOs, public-private partnerships, federal and state governments, local governments, bicycling advocate groups, and downtown business organizations

FINANCING

In the city of Lyon (as well as in Brussels, Belgium; Paris, France; Seville, Spain; and Dublin, Ireland) the program is funded by the transnational advertising company JCDecaux. Clear Channel funds programs in Stockholm, Sweden; Oslo, Norway; Barcelona, Spain; Perpignan, France; and Zaragoza, Spain. Advertising companies usually select cities that promise financial returns. Funding alternatives include local governments, charitable sources, nonprofit private organizations, federal and state subsidies, or public-private partnerships.

OPERATION

The rental operations are fully automated: the stations are on the street and can be accessed 24 hours a day, 7 days a week. Rentals are made through a digital terminal at the station, by using a credit card to obtain a short-term registration card or by using a yearlong subscription. The first 30 minutes are free.

LESSONS LEARNED

- Based on average rider speeds, bicycles are competitive with cars as a means of transportation.
- Grouping the stations by proximity between origin and destination is a good policy: short-range trips are best for shared bicycles. Closer stations exchange more bicycles than more distant stations do.
- Main network hubs should be close to train stations, residential zones, campuses, business/commercial and recreational areas, and downtown, where most trips take place.
- Most trips last 26–34 minutes, with a median of 11 minutes (reflecting the fact that the first 30 minutes are free).
- Trips are part of an intermodal transportation system. People use bicycles near train stations or buses mainly to commute to and from work: during weekdays people use them in the morning (8 a.m.–9 a.m.), at noon, and in late afternoon (5 p.m.–7 p.m.)—the peak. Weekends, people use them mostly at 5 p.m.
- In South Korean cities and in Barcelona, Spain, area density (in terms of destinations and population), the number of bikes and stations, and accessibility from origin to destination has a favorable effect on bike-share programs (increases commutes).
- Australian cities have calculated the following benefits per day of their bike-share program: congestion benefit—$199 (Australian); climate change benefit—$58 (Australian); and physical activity benefit—$3,645 (Australian).
- A coordinated bicycling policy is an important factor for the success of the program in different cities.
- Vancouver, BC shows that the built environment predicts bicycle mode: density (balance between residents and employments), land use mix (activity density per square mile), intersection density, proportion of developed land, and proximity to bike trails and bike lanes.
- Vancouver, BC also shows a negative association between bike use and topographic conditions (hilly pathways), weather (cold and precipitation), and age (people older than 65 bike less).
- In addition to infrastructure such as bicycle lanes, tracks, and racks, the success of bike-share programs depends on planning; infrastructure design; education for bicyclists, pedestrians and drivers; communication; law enforcement; marketing; program evaluation; and providing facilities such as showers and lockers for bicyclists.

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PROJECT CASE STUDY

Commercial Building Energy Retrofits

There are two forms of energy retrofit, conventional and deep, that can be applied to commercial buildings—a category that includes offices, public buildings, schools, and houses of worship but not multifamily residential housing. Conventional energy retrofits focus on isolated system upgrades with a quick payback (less than three years), such as lighting systems, HVAC systems, building envelopes, and retro commissioning. Deep energy retrofits achieve much greater energy efficiency by taking a whole-building approach to address many systems at once. A deep energy retrofit combines measures such as energy-efficiency equipment, air sealing, moisture management, controlled ventilation, insulation and solar control so that energy savings are achieved alongside optimal building performance.

One option for local governments looking to encourage commercial building energy retrofits is PACE programs. PACE (property assessed clean energy) is a financing mechanism that allows property owners to finance energy-efficiency and renewable-energy projects as a property tax assessment. The debt is typically secured by a senior lien on the property, which helps programs attract private capital at competitive rates and terms.

BENEFITS

ENVIRONMENT

- Reduce energy usage, leading to reduced costs
- Reduce carbon dioxide emissions
- Equity and Community
- Improve community stature
- Provide marketing and public relations value
- Create jobs and contribute to workforce training

ECONOMIC

- Raise rent premiums
- Increase occupancy rates
- Increase worker productivity
- Reduce employee sick days
- Enhance ability to attract and retain employees
- Reduce operating costs

BARRIERS TO IMPLEMENTATION

INSTITUTIONAL

The largest institutional challenge to establishing a commercial energy retrofit program stems from the fact that at one end of the spectrum large, centralized players control a substantial portion of the total floor space, while at the other end myriad small, local players each control a relatively small portion. Creating a program that can work at both ends of this spectrum can be difficult.

FINANCIAL

In general, it is hard for commercial retrofit projects to get funding through traditional means. Projects don't receive external financing because liens on newly installed equipment would require the consent of the primary mortgage holder, no contracted mechanism exists to ensure that cost-savings from lowered energy bills will be applied to loan repayment, and the premium market value of high-performance buildings has not yet been fully incorporated into the appraisal process.

Projects often do not receive internal funding because, while the return on investment is high, most retrofit projects are too small to

justify the trouble and effort. Also, when retrofit costs and energy cost-savings are passed from landlord to tenant, some capital improvement costs are amortized over a long period, extending the payback period for the landlord.

POLITICAL

The political barriers are similar to the institutional, in that they focus primarily on market fragmentation and the challenges of creating a program that serves both large- and small-scale commercial building owners. An additional question is whether there is political will to implement this type of program at all.

CASE STUDY EMPIRE STATE BUILDING

Beginning in 2008, an effort has been underway to retrofit the Empire State Building to make it the most energy-efficient pre-World War II building in the world. The primary motivation for the project was ownership's desire to prove or disprove the cost-effectiveness of energy retrofits. Secondary motivation included a desire to reduce greenhouse gas emissions and operating costs. Lastly, ownership wanted to address other aspects of sustainable operations, including issues such as water conservation, recycling, reuse of building materials, reduction of chemicals and pollutants, and indoor air quality.

STRATEGIC PARTNERS

The Empire State Building Company has partnered with the Clinton Climate Initiative, Jones Lang LaSalle, Rocky Mountain Institute, Johnson Controls Inc., and the New York State Energy Research and Development Authority on this work.

FINANCING

The total incremental cost for efficiency beyond planned infrastructure upgrades is $13.2 million. Some funding within the existing capital budget was re-allocated to different projects, while some funding was removed as projects were deleted, and other funding was added to support new efficiency projects. A financing solution that covers funding all costs and spreads all payments over the performance period or term is in development. Implementation period draws will be required monthly through the 18-month implementation schedule to meet construction requirements. The owner is seeking project financing that can be paid back over a 15- to 20-year period, depending on the offers available from respective financial institutions.

OTHER PROJECTS

- Empire State Building
- Denver Federal Center
- US Treasury Building

MUNICIPAL PACE PROGRAMS

- San Francisco Commercial PACE program
- Edina, MN Commercial PACE program
- Sonoma County Commercial PACE program
- South Florida Commercial PACE program
- Los Angeles County Commercial PACE program

IMPLEMENTATION

The retrofit consists of eight separate projects: Radiative Barrier; Tenant Demand Control Ventilation; Tenant Daylighting, Lighting, and Plugs; Balance of Direct Digital Controls; Chiller Plant Retrofit; VAV Air Handling Units; Building Windows; and Tenant Energy Management.

LESSONS LEARNED

For an energy-efficiency retrofit to be cost-effective, it needs to align with the planned replacement or upgrade of multiple building systems and components.

Energy-efficiency retrofits require the coordination of key stakeholders, including building management, property managers, tenants, and building science representatives (e.g., architects, engineers, energy modelers).

The current cost of energy and/or energy-efficiency technologies means there will be a gap between the socially desirable amount of carbon dioxide reduction and the financially beneficial amount of carbon dioxide reduction from the building owner's perspective.

REFERENCES

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Empire State Building: *http://www.esbnyc.com/sustainability_energy_efficiency.asp*

PROJECT CASE STUDY

Residential Energy Retrofits

Residential energy retrofit programs work with single-family homeowners to support them through the process of retrofitting their homes to increase energy efficiency and/or lower energy costs. These programs generally include three steps: assessment, financing, and retrofitting.

These programs developed in response to increased interest at all levels of government to reduce the carbon emissions of buildings, with energy-efficiency retrofits seen as "low-hanging fruit." Many of the existing programs at both the city and state levels received their initial start-up funding as part of the federal stimulus package.

BENEFITS

ENVIRONMENT

- Conserve energy
- Reduce carbon dioxide emissions

EQUITY AND COMMUNITY

- Allow interested homeowners to overcome potential financial barriers to participation
- Provide help to those living in energy-inefficient housing
- Provide workforce training and apprentice opportunities for this new line of retrofitting business
- Improve overall quality and performance of existing housing stock

ECONOMIC

- Create and retain jobs (like livable-wage construction jobs) in the area
- Provide utility bill savings and resulting discretionary income for homeowners

BARRIERS TO IMPLEMENTATION

INSTITUTIONAL

The largest barrier is determining the appropriate party that will be responsible for administering the program. Most current programs are run by the city as part of its departmental responsibilities or in partnership with a nonprofit organization with experience in energy efficiency. This nonprofit organization can either be already established or newly formed for the purpose of administering the program. More and more, cities are turning to local utilities to finance and administer the program. A good example of this is the Bainbridge Island retrofit program, which is being implemented by the Conservation Services Group, Inc.

FINANCIAL

Residential energy retrofit programs require upfront funding for the energy assessment and the retrofitting, which is a common barrier for participation. While some homeowners may be able to pay the initial costs and be reimbursed later, many will not. Accordingly, the entity implementing the program (either public or private) will need access to a large source of funding to provide to homeowners or directly to the contractors doing the work. In instances where the homeowner provides the initial funding, reimbursement comes from the city and/or the state in the form of rebates, tax credits, and direct payment. Where a utility has assumed financial responsibility, an additional charge is added to the homeowner's monthly utility bill to pay back the cost of the retrofit.

POLITICAL

Fannie Mae and Freddie Mac, the two government-sponsored enterprises that secure all U.S. home mortgages, have expressed an unwillingness to secure the mortgage of a house that has an energy retrofit payment lien that is senior to the mortgage. As a result, many of the original energy retrofit programs have ceased.

CASE STUDY CLEAN ENERGY WORKS OREGON (CEWO)

CEWO began as a pilot program of the City of Portland and was initially funded through a grant from the U.S. Department of Energy. The program provides the financing and expertise required for home energy-efficiency remodels.

STRATEGIC PARTNERS

CEWO is a non-profit organization created by the City of Portland Bureau of Planning and Sustainability (BPS), who works in partnership with Energy Trust of Oregon, utilities, financial institutions, local communities and contractors—including the BPS, the Oregon Department of Energy, Craft3 (CDFI), NW Natural, Pacific Power and PGE. Homeowners apply to participate.

FINANCING

The pilot program's loan fund was started with Recovery Act funds from the Energy Efficiency and Conservation Block Grant (EECBG) program and other City resources. Financing for program participants is provided by Craft3 (CDFI), Umpqua Bank (community bank), SOFCU Community Credit Union, Pacific Crest Federal Credit Union, Community Credit Union also provide.

IMPLEMENTATION

The program consists of three parts: assessment, financing, and retrofitting. Once a home is accepted into the program, a Building Performance Institute-certified contractor conducts a Home Energy Assessment to identify energy-savings opportunities and the estimated impact on the home heating bill. Based on identified need and estimated cost-savings, upfront financing is provided to the homeowner to pay for the retrofits with the loan payment assessed from the cost-savings by the utility company.

OTHER PROJECTS

- Home Performance with ENERGYSTAR
- **PORTLAND, OR** Clean Energy Works Oregon
- **CALIFORNIA** CHF Residential Energy Retrofit
- **FLAGSTAFF, AZ** Flagstaff Residential Energy Retrofit
- **TUCSON, AZ** Residential Energy Efficiency Retrofit
- **BABYLON, NY** Long Island Green Homes

LESSONS LEARNED

- While more expensive initially, programs that take a "whole house" approach and do all needed retrofits at once see greater overall cost-savings than programs that finance individual projects within a home.
- An initial assessment of potential cost-savings is critical for knowing which potential upgrades have the shortest payback period. Projects with a long payback period, while sometimes very effective, are not usually feasible for this type of program.
- The city or agency managing the program needs to establish guidelines for quality work and make sure that both contractors and homeowners are familiar with the guidelines.
- Middle-income, educated homeowners are the most likely to participate in these programs.
- Cities or organizations should target specific geographic areas with the demographics and home era best suited for the program.

REFERENCES

Clean Energy Works Oregon: *http://www.cleanenergyworksoregon.org/*

CHF Residential Energy Retrofit Program: *http://chfloan.org/Programs/Energy/energy_program.html*

U.S. Department of Energy: *http://www1.eere.energy.gov/wip/retrofit_guidelines.html*

PROJECT CASE STUDY

Smart Grid

"Smart grid," as defined by the U.S. Department of Energy, will be a fully automated power-delivery network that monitors and controls every customer and node, ensuring a two-way flow of electricity and information between the power plant and the appliance, and all points in between. This distributed intelligence, coupled with broadband communications and automated control systems, enables real-time market transactions and seamless interfaces among people, buildings, industrial plants, generation facilities, and the electric network. The goal is to use advanced, information-based technology to increase the efficiency, reliability, and flexibility of the power grid and to reduce the rate at which additional electric utility infrastructure needs to be built. While the smart grid has not yet been fully realized, incremental steps have been successfully applied in many settings.

BENEFITS

ENVIRONMENT

- Reduces overall electrical demand, increase reliability of the grid, and enables cost-effective measurement of grid performance
- Lowers greenhouse gas emissions
- Provides residents with tools to manage their electricity use and encourage real-time pricing

EQUITY AND COMMUNITY

- Protects grid from physical and cyber threats by improving identification and response to man-made or natural disruptions
- Provides reliable power to smaller, rural communities
- Supports widespread use of distributed generation; thereby benefitting the community. Standardized power and communications interfaces allow consumers to interconnect fuel cells and renewable generation on a simple "plug and play" basis.
- Increases consumer control over energy consumption and expenses by providing useful information to inform decisions
- Provides consumers better control over appliances

ECONOMIC

- Saves consumers money by allowing them to "time shift" their usage to take advantage of off-peak hours to lower their energy bills
- Self healing grid anticipates and responds to system problems
- Achieves greater throughput (greater efficiency in communication capabilities to the electric grid while reducing energy consumption), thus lowering power costs
- Enables consumers to generate and sell excess power to the grid through renewable power

BARRIERS TO IMPLEMENTATION

INSTITUTIONAL

The smart grid requires interoperability on a number of levels (technologies installed by one utility must be able to communicate with those installed by another). The National Institute of Standards and Technology, which is responsible for developing interoperability standards, predicts that hundreds of consistent standards will be necessary to regulate the smart grid.

Success of the smart grid relies on customers using and responding to new technologies, price signals, and information in new ways. Regulators and distribution utilities will need to educate consumers on how to use smart grid technology. Utilities should also provide internal feedback to the consumer, for instance, by enabling smartphones and computers to monitor and adjust loads to increase efficiency and lower bills.

FINANCIAL

The business model on which most electric utilities work (i.e., the more electricity consumers use, the more money the utility earns) is an obstacle to achieving a smart grid that reduces consumption. Installing smart systems such as advanced metering systems and remote connections requires huge investments from utilities.

POLITICAL

The smart grid requires large-scale coordination among various stakeholders, including the federal government that regulates transmission. One of the major challenges in implementing the smart grid is the coordination required between the Federal Energy Regulatory Commission and each of the states involved. Uncertainties around the National Climate Policy could have a major impact on the support for clean technology and, consequently, budget allowances. Designed to allow real-time contact between utilities and meters in customers' homes and businesses, there is a very real risk that these capabilities could be exploited for criminal or even terrorist actions.

CASE STUDY PECAN STREET PROJECT

The Pecan Street project is a pioneering smart-grid research and demonstration program based in Austin, Texas' historic Mueller neighborhood. It provides Austin with 300 megawatts of renewable energy produced within city limits and with smart meters installed in homes and businesses. Progress on the smart grid is quicker in Texas than in other places as it is the only state in the country with its own power grid.

STRATEGIC PARTNERS

Pecan Street is a public-private collaboration between Austin Energy, the City of Austin, the University of Texas at Austin, the Environmental Defense Fund, Electric Reliability Council of Texas, and corporate partners such as Cisco, Dell, Gridpoint, IBM, GE, Applied Materials and Intel.

FINANCING

The program was originally funded by a $10.4 million smart grid demonstration grant from the U.S. Department of Energy, and it has since received more than $14 million in matching funds from project partners.

IMPLEMENTATION

In the first phase of the project, an action plan was developed to deal with new smart grid technologies as they move from prototype to consumer stages. Eventually, Austin Energy hopes to create a research consortium to develop new products.

In November 2009, the U.S. Department of Energy awarded Pecan Street Project, Inc., a demonstration grant to deploy an advanced smart grid project at the Mueller development in central Austin. In February 2011, the organization completed systems installation and went live with the first phase. Deployed by Incenergy LLC, the home smart grid systems capture energy usage for the whole home and six major appliances/systems. The installed cost per home for program participants was $341 ($241 for equipment, plus $100 for installation).

During the 12-month first phase, project researchers monitored how individual homeowners used electricity, gas, and specific appliances, and will use the data to structure next-generation home smart-grid systems. These systems, which selected companies will deploy in the project's second phase (which began in March 2012), will enable customers to manage individual appliances and systems as well as electric vehicle charging and rooftop photovoltaic systems.

LESSONS LEARNED

Smart grid costs vary dramatically. Since smart grids rely on sophisticated technology for communication and control activities, large investments in infrastructure are needed. There is a high degree of uncertainty regarding costs, making it difficult for decision-makers to assess the cost of implementation. For instance, the cost of installing smart grid technology in Boulder, CO, was nearly triple the expected cost, mainly due to uncertainties in creating the fiber-optics infrastructure.

It is difficult to measure benefits. Many of the benefits of a smart grid come from anticipated changes in consumer behavior. If customer demand is not notably affected, then the costs of smart grid implementation may outweigh the benefits. In Connecticut, customers were given a globe that glowed different colors based on the price of electricity. However, customers did not change their electricity usage behavior to the extent predicted.

Security and privacy standards must be developed. Since these devices monitor and collect large amounts of information, there is concern that consumer privacy could be at risk.

Consumers need to be educated on integrating and using this new technology; there has been backlash in California due to lack of information about using smart meters.

Smart grid projects represent large capital expenditures for utilities. As metering components and communications systems become more standardized, costs may come down. Consumers bear much of the cost of smart grid projects through rate increases. At the same time, consumers who are active in managing their electricity consumption will benefit in the long run from decreased peak electricity consumption and a lower total cost of energy. A U.S. Department of Energy smart grid demonstration project in Olympic Peninsula, Washington, found that consumers save 10 percent on their utility bills.

OTHER PROJECTS

- **BOULDER, CO** SmartGridCity Project
- **FORT COLLINS, CO** FortZED Net Zero Energy District
- **MAUI, HI** Maui Smart Grid Project
- **ONTARIO, CANADA** Hydro One Project
- **ITALY AND SPAIN** Telegestore Project
- **MANNHEIM, GERMANY** City of Mannheim Project
- **EVORA, PORTUGAL** InovGrid smart city project

REFERENCES

Pecan Street Project: *http://www.austinenergy.com/about%20us/company%20profile/smartGrid/index.htm*
http://www.pecanstreet.org/

Smart Grid's Potential for Clean Energy: *http://epa.gov/statelocalclimate/documents/pdf/background_paper_3-23-2010.pdf*
http://www.c2es.org/technology/factsheet/SmartGrid

U.S. Department of Energy, Office of Electric Transmission and Distribution. "Grid 2030" – A National Vision for Electricity's Second 100 Years, July 2003, p. 27.

PROJECT CASE STUDY

District Energy

District energy systems provide an energy-efficient and cost-effective option for heating and cooling many buildings in a given locale, from a central plant. They use a network of underground pipes to pump steam, hot water, and/or chilled water to multiple buildings in an area such as a downtown district, college or hospital campus, airport, or military base. Providing localized heating and cooling requires less fuel and avoids the need to install separate heating and cooling and hot water systems in each building.

District energy systems can use a variety of conventional fuels such as coal, oil and natural gas—whichever fuel is most competitive at the time. And because of a district energy system's size, the district energy plant can also transition to use renewable fuels, such as various forms of biomass including wood and food processing waste, geothermal heat, and combined heat and power. Often, district energy systems are connected to combined heat and power (CHP) plants. Also known as cogeneration plants, CHP plants generate electric power in addition to heating and cooling, and can achieve energy efficiencies above 80 percent.

According to the International District Energy Association, more than 700 district energy systems are currently operating in the United States (including at least one system in each state), some of which date back to the 1800s.

BENEFITS

ENVIRONMENT

- Conserve energy
- Reduce carbon dioxide emissions

EQUITY AND COMMUNITY

- Make the benefits of renewable energy available to the individual building owner
- Increase comfort and convenience for customers
- Improve reliability of energy services

ECONOMIC

- Allow building owners to save money on energy costs for reinvestment elsewhere
- Offer an attractive return on investment
- Decrease building capital and life-cycle costs
- Generate local jobs by installing the system

BARRIERS TO IMPLEMENTATION

INSTITUTIONAL

Because district energy systems require installation of major long-term infrastructure (in the form of energy plants and piping infrastructure within the public right-of-way), some form of public

involvement is often required. Even if the city does not have an ownership stake in the system, it will likely need to facilitate district energy development through policy mechanisms and incentives, zoning code amendments, expedited permitting, and/or helping to convene the relevant project stakeholders.

FINANCIAL

Because district energy systems require a high initial capital expenditure and financing for equipment, they are a long-term investment with a potentially long payback period. They are less attractive for areas with low population density or many small buildings; because each connection of a building to the system is quite expensive, in such areas the investment per building is considerably higher.

POLITICAL

There may be some concerns by city leaders about a private entity owning and operating a district energy system that operates partly on or under public right-of-ways.

CASE STUDY ST. PAUL, MN

St. Paul's district energy system was launched as a demonstration project in 1983 as a response to the energy crises of the 1970s. It was a public-private partnership between the City of St. Paul, State of Minnesota, U.S. Department of Energy, and the downtown business community. Currently, more than 185 buildings and 300 single-family homes (31.8 million square feet) are heated and 100 buildings (18.8 million square feet) are cooled in downtown St. Paul and adjacent areas through this system.

STRATEGIC PARTNERS

The system is owned and operated by District Energy St. Paul, a nonprofit organization established to operate the system. District Energy St. Paul partners with Ever-Green Energy to promote conservation and increased use of renewable energy sources.

FINANCING APPROACH

After receiving initial funding from federal, state, and local government sources, the organization supports its ongoing operations and maintenance costs from the rates paid by customers for heating and cooling services.

IMPLEMENTATION

District Energy Saint Paul contracts with its customers to provide heating and/or cooling services for a set period of years at a negotiated price. These contracts are typically 20 years in length, so the first round of contracts are coming up for renewal now with most customers choosing to continue the service.

OTHER CITIES

- St. Paul, MN
- Houston, TX
- Boston, MA
- Detroit, MI
- New Orleans, LA
- Battle Creek, MI
- Cleveland, OH
- Seattle, WA
- New York, NY
- Cornell University, NY
- Princeton University, NJ
- University of Texas, TX

LESSONS LEARNED

- Planning and coordination between policy makers, energy suppliers, and customers is critical for establishing clear goals and agreement on the means of achieving said goals.
- Evaluating current and projected heat and cooling demands, as well as available sources, is essential for establishing an energy-efficient, cost-effective supply system.

REFERENCES

International Energy Agency: *http://www.iea.org/files/CHPbrochure09.pdf*

St. Paul, MN, District Energy: *http://www.districtenergy.com/*

International District Energy Association: *http://www.districtenergy.org/*

PROJECT CASE STUDY

District Waste Water Management

District waste water management systems provide collection, treatment, and dispersal or reuse of wastewater from individual buildings or clusters of buildings near the location where the waste is generated. These systems may treat sewage onsite through natural and/or mechanical processes, or may utilize more distributed management systems to collect and treat waste at a neighborhood, district, or small community scale. Examples of decentralized approaches range from passive systems such as composting toilets, gravity-fed grey water wetland treatment systems and living machines to more energy-intensive recalculating bio filters and membrane bioreactors.

Studies indicate that more distributed methods of collection, that rely mostly on gravity-fed pipes, will have fewer negative environmental impacts than systems that expend large amounts of energy for conveyance.

Current practices for managing wastewater nation-wide involve conveying waste to large-scale, centralized treatment systems, some of which need expansion or are outdated, often resulting in the introduction of polluted water into the region's waterways. On-site or neighborhood-scale systems present an interesting alternative to capturing and treating waste from the built environment.

BENEFITS

ENVIRONMENT

- Less energy intensive than conventional, centralized systems
- Fewer environmentally harmful chemicals used to disinfect effluent from wastewater stream
- Less toxic sludge as a byproduct
- Less greenhouse gas emissions from construction and operation of centralized systems
- Uses non-potable instead of potable water whenever possible

EQUITY AND COMMUNITY

- Development and installation of appropriately scaled systems that can meet fluctuating community needs while still providing the expected convenience of tidy, odorless waste elimination

	FOOTPRINT	OPERATING ENERGY	TECHNOLOGY
Composting toilets + Constructed wetland*	Small – Large**	Zero – Low	Non-water discharging containment system Nutrient recovery Attached growth aerobic treatment
Constructed wetland	Small – Large	Zero – Low	Attached growth aerobic treatment
Recirculating biofilter	Medium	Low – Medium	Attached growth aerobic treatment
Membrane bioreactor	Small – Medium	High	Suspended growth aerobic treatment with synthetic membrane ultra-filtration

* Constructed wetland for treatment of greywater from sinks, baths/showers and laundry.
** Wetland and soil dispersal area for greywater can have large space requirements depending on generated flow.

TABLE 1: Various distributed technologies used to treat water and wastes (*Source*: Cascadia Green Building Council)

- Allows for dual use of land

ECONOMIC

- Less capital intensive than conventional, centralized wastewater treatment systems (reduced need for long-distance piping, pump stations, and associated infrastructure)
- Reduces capital costs for utilities of developing connection systems
- Reduces long-term operating costs for utilities of water use and discharge

BARRIERS TO IMPLEMENTATION

INSTITUTIONAL

In areas where development codes and public health regulations require connections to public utilities, small-scale decentralized systems frequently lack a clearly defined regulatory pathway for approvals and instead rely on developers with the will or financial means to navigate the regulatory system.

FINANCIAL

A project owner's upfront investments in on-site treatment systems may pose a financial barrier. These barriers may be directly related to the regulatory barriers. For example, backup or redundant connections to municipal wastewater utilities may be required by codes even when a system is designed and operated not to use them. Some municipalities have instituted innovative fee structures, such as in Portland, Oregon, whose Bureau of Environmental Services allows for emergency-only connections to its wastewater treatment facilities but charges large usage fees in the event the connection is needed.

CULTURAL

Public fears about the safety of on-site wastewater management present significant obstacles. Such fears are rooted in historical management of water and waste and the associated public-health

OTHER EXAMPLES

- **SAN FRANCISCO, CA** Public Utilities Commission project
- **RHINEBECK, NY** Omega Center for Sustainable Living
- **KANSAS CITY, MO** Anita B. Gorman Conservation Discovery Center

issues. On-site systems are perceived to be a step backward in time and technology to a less-developed age. Education and awareness among regulators, designers, engineers, and building occupants is necessary to fully highlight the environmental risks associated with wasteful practices.

CASE STUDY ORE. HEALTH & SCIENCE UNIV.

Completed in October 2006, the Center for Health & Healing at the Oregon Health & Science University (OHSU) is a 396,000-square-foot development. The building employs various green strategies, including an on-site wastewater treatment plant membrane bioreactor (MBR), which recycles 100 percent of wastewater resulting in a 60 percent reduction in the use of potable water.

STRATEGIC PARTNERS

RIMCO LLC is owned jointly by OHSU Medical Group and OHSU to develop, own and operate real property. Gerding/Elden Development developed the project.

FINANCING

The project's total construction cost was $145 million, with the mechanical, electrical and plumbing (MEP) systems costing $27 million (almost 10 percent less than the $30 million for conventional designs). The projected savings per year for water and utility use is 5.5 million gallons and $40,000. Greening costs came to $1.8 million, but tax credits and incentives for green initiatives decreased the development costs by $1.2 million. The project earned LEED Platinum certification, which earned it another $600,000 in tax credits.

IMPLEMENTATION

The on-site sewage treatment plant recycles all the building's wastewater, including medical waste, sewage, and stormwater, to a tertiary level. The treated water is reused for irrigating the green roofs, campus green, and landscaped areas; for flushing toilets and urinals; as cooling tower water and for landscape water features. Biological sludge generated in the treatment process is pumped to the city sewer system, contributing only a fraction of the sewage load that would otherwise have been discharged. The membrane bioreactor was designed to be modular so that it can be expanded as the campus grows. A new discharge point to the Willamette River was required and permitted. Care is taken to make sure that the temperature of the discharged water does not adversely affect the river temperature. The plant is located in the below-grade parking levels and is essentially a scaled-down version of a typical municipal plant, processing 4,000 gallons per day. It employs waste-consuming bacteria in a bioreactor system, and produces water that is just less than potable. The plumbing system also collects all the rainwater falling on the site, as well as groundwater pumped from the underground parking garage, and adds them to the same supply.

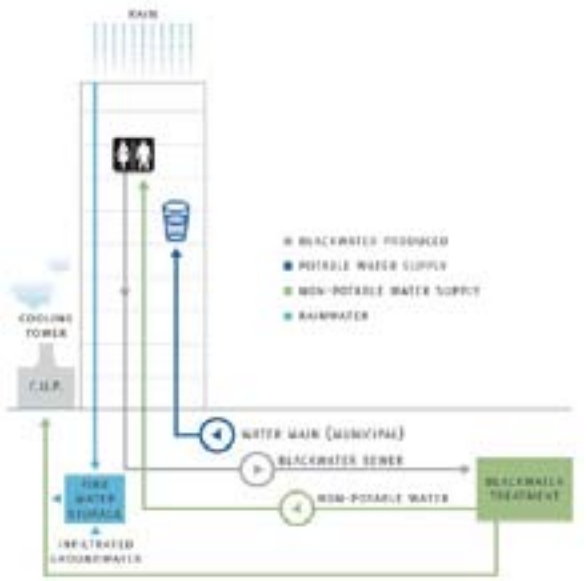

DIAGRAM 1: below is a schematic representation of how treated water will be reused on campus (*Source*: Interface Engineering)

LESSONS LEARNED

- Wastewater regulations established to protect risk to public health need to be assessed and updated to fully account for current environmental, social, and economic risks related to centralized wastewater treatment systems, creating new standards in support of more integrated waste treatment systems at the site and neighborhood scales.
- Removing regulatory barriers can help spur market innovations and new products available to designers and homeowners pursuing decentralized and distributed systems, thus bringing down upfront costs. Financial incentives for on-site renewable energy generation have been accelerating market adoption, serving as examples for similar approaches for decentralized and on-site wastewater systems.
- Addressing cultural barriers around decentralized water systems requires a shift in the way we view human waste. Education will likely be the key tool to overcome the uncomfortable feeling of using decentralized systems such as composting toilets.
- As the environmental and economic costs of maintaining and operating centralized wastewater systems continue to grow, installation of appropriately scaled systems that can meet fluctuating community needs while still providing the expected convenience of tidy, odorless waste elimination is the solution for the future.
- While many wastewater treatment systems, such as living machines and bioreactors, are currently installed to serve one building, there is an opportunity for economies of scale to size these systems to serve multiple buildings and even an entire district.

REFERENCES

Alternative wastewater treatment strategies in the Puget Sound area: *http://cascadiagbc.org/resources/research-2/Clean%20Water,%20Healthy%20Sound*

Oregon Health & Science University case study: *http://www.ohsu.edu/xd/about/services/cpdre/planning/upload/Section-4.pdf*

NDRC Building Green OHSU: *http://www.nrdc.org/buildinggreen/casestudies/ohsu.pdf*

PROJECT CASE STUDY

District Stormwater Management

Urban stormwater management is typically managed through underground pipes, or "grey" infrastructure. District stormwater management systems focus on the hydrological cycle and on intercepting, infiltrating, detaining, and evapotranspiring as much rainfall as possible rather than conveying surface runoff into pipes and streams. This approach is known as "green" infrastructure, and can also be described as preserving the local on-site water balance. This not only reduces the amount of stormwater available for runoff, but also reduces the pollution from urban nonpoint sources that enter local streams. Stormwater management infrastructure still has to deliver on all design objectives, which can generally be listed as local water balance maintenance, flood protection, erosion control, and stormwater quality enhancement. Neighborhood-scale stormwater management should begin with rainwater management at the site or individual property level and then scale up to the watershed level.

Examples of innovations at the property level include harvesting roof runoff, treating and reusing water, managing rainwater by infiltration into swales and soil in bio-retention areas, minimizing impervious surfaces, and using pervious pavement. At the neighborhood level, runoff impacts are mitigated by designing roads without curbs, gutters, or drain pipes, and diverting runoff into infiltration channels, swales, and wetlands. Other examples of neighborhood-scale stormwater management systems include green roofs and curb extensions.

BENEFITS

ENVIRONMENT

- Less energy intensive than conventional systems
- Reduces contaminants that can enter urban streams by preventing nonpoint source pollution
- Lessens runoff
- Improved stormwater quality through removal of sediment using strategies such as pervious pavements

EQUITY AND COMMUNITY

- Development and installation of appropriately scaled systems that can meet fluctuating community needs while still providing the expected convenience of managed stormwater
- Reduces non-point source pollution and sediment loads that enter local streams
- Bioswales and retention ponds double as attractive neighborhood amenities and contribute to overall neighborhood greening

ECONOMIC

- Less capital intensive than conventional systems (reduced need for long-distance piping, storm sewers, and associated infrastructure)

- Reduced paving costs by minimizing width of roads and directing runoff into roadside infiltration swales

BARRIERS TO IMPLEMENTATION

INSTITUTIONAL

The shift from grey to green necessitates a fundamental change in the relationship between public utilities and property owners. Residential property owners pursuing new kinds of green infrastructure may face delayed permitting processes because projects do not follow typical standards. Decreased space between buildings and the amount of property "sacrificed" to create the stormwater system also is a perceived barrier.

CULTURAL

Common cultural barriers include the belief that stormwater management is the city's problem. A related challenge is lack of awareness about program and design alternatives and insufficient information about potential effects on property. These barriers can be overcome through public outreach programs.

CASE STUDY NE SISKIYOU GREEN ST

STRATEGIC PARTNERS

The Northeast Siskiyou Green Street project is a good example of an effective public-private partnership with the Portland Bureau of Transportation and local property owners. The simple street modification fully integrates stormwater management into the local streetscape, resulting in an attractive amenity for local property owners. The Bureau of Environmental Services worked with neighboring property owners to design the infiltrating areas to complement private landscaping. Property owners agreed to assist with simple maintenance once the City plantings were established.

FINANCING

The Innovative Wet Weather Program in Portland is an initiative to develop projects that manage and treat runoff from the city's developed areas. The goal of this program is to keep runoff from entering the stormwater system when possible or to manage the water before it is released.

In 2003 and 2005, the City of Portland was awarded two federal grants totaling $1.68 million to further invest in these and other public and private projects that demonstrate sustainable stormwater management solutions. The City of Portland added another $1.35 million in matching funds.

OTHER EXAMPLES

- **MONTGOMERY, MD** White Oak Neighborhood Stormwater Retrofit
- **FORT WRIGHT, KY** Northern Kentucky Sanitation District No. 1 Project
- **PORTLAND, OR** Taggart D—1,200-acre G.I. Retrofit
- **UTICA, NY** Green Innovation Grant Program (stormwater tree pits and rain barrels)

The total cost of the NE Siskiyou project, including management, design, and construction, was $20,000, of which $3,000 was used for ancillary street and sidewalk repairs that might not be needed for similar projects. For the stormwater curb extensions alone, the total cost was $17,000, or $1.83 per square foot of impervious area managed.

IMPLEMENTATION

The projects constructed under the Green Streets category of the Innovative Wet Weather Program must accomplish the goals of reducing the occurrence of overflows where sanitary and storm sewers are combined, treating polluted runoff, and increasing the amount of vegetation in the city. Both public and private projects must consider the category and range of the goals in this category and range for simple retrofits and new pervious paving surfaces.

The NE Siskiyou Green Street is a demonstration project that essentially disconnects the street's rainwater runoff from the city's combined storm/sewer pipe system and manages the water on-site using a landscape approach. With the new stormwater curb extensions now in place, nearly all of NE Siskiyou's annual street runoff, estimated at 225,000 gallons, is managed by its landscape system. In fact, the curb extensions have the ability to reduce the runoff intensity of a typical 25-year storm event by 85 percent.

LESSONS LEARNED

- As the environmental and economic costs associated with maintaining and operating city-scale sewer systems continue to escalate, installation of appropriately scaled systems that can meet the fluctuating needs of a community while still providing the expected convenience of managed stormwater runoff is the solution for the future.
- Local and state incentives are important vehicles to decrease the initial cost of stormwater management within green buildings. Sites promoting financial strategies and managementalternatives is essential for neighborhood-scale stormwater management. Extensive public outreach programs are opportunities for fund-raising and for communities to come together to support the initiative.
- Removing regulatory barriers, such as slow permit processes, can help spur the market for property owners to pursue decentralized and distributed systems, thus bringing down upfront costs.
- Cultural barriers such as perceived risk of basement flooding (e.g., from downspout disconnection) can be overcome by outreach programs and incentives organized by the City or non-profits.

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Innovation in stormwater management: *http://cbtadaptation.squarespace.com/storage/2008-049_Marsalek_and_Schreier_-_innovations_in_stormwater_management.pdf*

NE Siskiyou Green Street case study: *http://www.asla.org/sustainablelandscapes/greenstreet.html*

Portland Bureau of Environmental Services, NE Siskiyou Street: *http://www.portlandonline.com/bes/index.cfm?a=78299&c=45386*

What's next with PoSI

North American EcoDistricts Program

Building on the momentum and lessons captured from the EcoDistricts Institute, the Portland Sustainability Institute (PoSI) will launch a North American EcoDistricts Program in late 2012 or early 2013 to further support leading cities who will implement EcoDistrict projects in their own communities. Working with the City of San Francisco and CH2MHill over the coming months, we will be engaging city, industry, and NGO leaders to design an implementation and business plan to present to cities and funders later this summer. To learn more, contact Naomi Cole at *ncole@pdxinstitute.org*.

International EcoDistricts Summit

Join us for the third annual EcoDistricts Summit this October! The 2012 International EcoDistricts Summit will provide an opportunity for EcoDistricts Institute participants to reconnect, report on their progress and share lessons learned following the Institute. Stay tuned for program and conference details.
To reward your sustainability leadership, we're offering a $75.00 discount to the EcoDistricts Summit for all Institute attendees. Talk to a PoSI staff during the Institute or email *summit@pdxinstitute.org* for your discount code.

Building the Global EcoDistricts Marketplace

PoSI is a global leader in promoting sustainable neighborhood development. We serve a diverse range of public and private sector clients including city agencies, real estate and infrastructure developers, property and portfolio management firms, schools, and design and engineering firms. Over the past three years, PoSI has developed a suite of practical tools, resources and consulting & training services to help clients successfully launch EcoDistrict projects. They include:

- EcoDistrict Development & Strategy
- District Planning & Assessment
- Integrated Infrastructure
- District Utilities
- Green Economic Development

To learn more, contact Naomi Cole at *ncole@pdxinstitute.org*.

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